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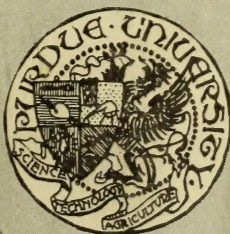
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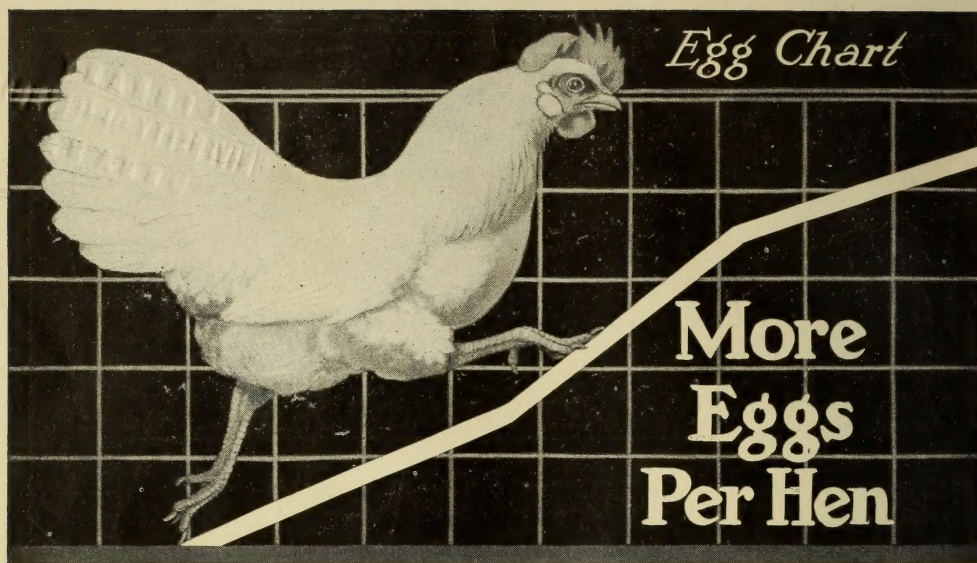
The PURDUE AGRICULTURIST



OCTOBER, 1919



Vol. 14 No. 1



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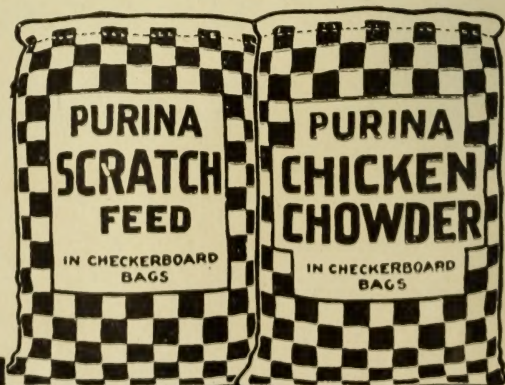
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THE PURDUE AGRICULTURIST

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THE SEASON OF PLENTY

THE PURDUE AGRICULTURIST

VOLUME XIV

OCTOBER, 1919

NUMBER 1

Purdue and Its Influence

By T. R. Johnson

WITH the largest enrollment in its history, two new buildings already completed on the farm and a new women's building promised for the campus, and last a spirit among the student body that is stronger than it has been for years, it may be stated truthfully that the opening of school September 10, 1919, marked the beginning of a new era in the development and growth of Purdue University.

appreciable number of young women have come from other institutions to complete their University work here, and it augurs well for the future of the co-eds in Purdue.

In a building way, the university is following the governmental request to "build now." A new horse barn, said to be the last word in construction of homes, has just been completed and at a cost of \$31,000. It is made of brick with concrete

Purdue has a wonderful opportunity this year with a record enrollment, new buildings going up, and more to follow, and a spirit that is unbeatable. This school is second to none, anyone will admit, while we concede it is the best. However, a 100 per cent boosters' organization will always do a great deal of good. Now, All together!—The Editor.

The School of Agriculture as well as every other college in the entire university has the largest freshman class in its history which indicates that the "after the war" period is going to be eventful for Purdue. The total enrollment this year is slightly in excess of 2,600 and optimistic members of the faculty and student body are predicting 3,000 for next year. A number of new instructors had to be employed this year to care for the influx of students.

Included in the ranks of the agricultural classes, which number upwards of 600, are four girls, bonafide "ag" students. Incidentally, there are 260 co-eds in the institution this year with 240 of them taking home economics and the remainder scattered through the science and pharmacy schools. About twenty-five of them have had work at other colleges or universities and they are coming here to graduate. This is the first year that any

floors, red tile roof and is well equipped with feed rooms, stalls, and other features for the increased number of pure bred horses which will be grown on the farm. Plans have been laid to extend the work, in both experimental and class work with horses.

The new cattle barn, which will house Purdue's now famous herds of beef animals, is practically complete and makes a valuable addition to the farm buildings. It is stuccoed and with a red tile roof presents an attractive appearance.

Plans are being prepared now for the woman's building which will be erected next year on the site of the present Ladies' Hall. The new structure which will be devoted to class and laboratory work alone will cost in the neighborhood of \$150,000.

The 1919-20 spirit and "pep" of the student body has never been excelled in Old Purdue. The school to a man—and a

woman—is behind the football team and new athletic regime. Each evening several hundred students and faculty throng the sidelines or fill the bleachers on Stuart field while the candidates for the football squad execute the plays with which the team hopes to bring home a healthy share of victories.

As it is in athletics, so it is with every line of activity in the whole university. Clubs of every sort have been revived with maximum memberships and things

are "rolling" fine for every organization in the school.

It may appropriately be said that judging from appearances about the campus, the feeling of real spirit in the air, and the big projects under way that Purdue has its real stride and already has taken a big step forward into a period of expansion and development which will greatly extend the influence it has wielded in Indiana and other states for years.



A wealth of wasting plant food

The Conservation of Farm Manure

L. L. Brown, '21.

FARM manure is known under a variety of names, such as; manure, mixed manure, barnyard manure, stable manure, etc. The word manure is used sometimes to include only the excrements. In this article the word includes mixed manure, both solid and liquid, of farm animals, and the material added in the form of bedding. Farm manure is therefore a mixture of three general classes of constituents as: 1. The feces from domestic animals. 2. Their urine. 3. The material used for bedding.

Because of the valuable composition of manure, it is worth conserving. This composition will vary to a certain extent on each and every farm. It will vary because of these factors: 1. The kind of animals, whether horses, cows, sheep, or hogs. 2. The age of the animals. 3. The purpose of the feeding, whether one is

growing, fattening, or maintaining his stock, or feeding cows for milk. 4. The composition of the feed fed. In all cases the manure contains three of the most needed elements for plant growth and the production of grain, namely: nitrogen, phosphorus, and potassium. As a general rule we may say that the plant food composition of one ton of average stable manure is approximately 10 lbs. of nitrogen, 5 lbs. of phosphorus, and 10 lbs. of potassium. Valuing nitrogen at 30 cents a pound, phosphorus at 8 cents a pound, and potash at 25 cents a pound makes a ton of average stable manure worth approximately \$5.90. This seems rather small, but when one stops to think of the amount of manure produced each year by farm animals, it is by no means insignificant. To bear out this latter point, the following figures are given. They

show the amount of manure, including bedding, produced per thousand pounds of live weight per year.

Horse.....	18,000 lbs.
Cow.....	27,000 lbs.
Pig.....	30,000 lbs.
Sheep.....	12,500 lbs.
Hen.....	8,500 lbs.

As a general rule in the case of farm animals, without reference to kind or age, it is a fair estimate to state that 80 per cent of the nitrogen, phosphorus, and potash in the feed consumed, is recovered in the manure. From work horses and fattening animals from 90 to 95 per cent

To prevent this great loss of plant food to a large measure, three things may be done. 1. Save the urine. 2. Avoid decay. 3. Prevent decomposition.

To save the urine, mechanical and chemical absorbents may be used. In the first place have water-tight floors in your stables. Then use plenty of straw or shredded-fodder for bedding, and in addition add land plaster, kainite, acid phosphate, or raw rock phosphate. The ammonia which contains the nitrogen is absorbed by these and thus the nitrogen is largely saved. Any of the above named chemical absorbents may be used at



Never delay this operation

may be recovered, while from milch cows and growing stock only 50 to 70 per cent is in the manure.

To conserve farm manure we endeavor to prevent the loss of the plant food contained, and to put it back on the land. It is impossible to save all that is in the fresh manure, because in the case of nitrogen from 15 to 20 percent will escape regardless of your best efforts. However with proper care the phosphorus and potash may be nearly all saved. The all too common practice is to allow the urine to soak away into the ground about the stables, and the solid portion to burn itself away. In six months time from 60 to 70 percent of the plant food constituents are lost under the common practice of handling manure.

the rate of one pound per day per thousand pounds of live weight of stock. Sprinkle the material daily over the bedding and over the manure. Kainite, however, eats the horses' hoofs, and should never be placed in the stalls. Under no circumstances should wood-ashes or lime be mixed with manure. They cause a very rapid decay and loss of nitrogen.

As is the case during certain seasons of the year, when the manure cannot be hauled directly from the stables to the field, it must be piled up. Precautions may be taken which will greatly reduce any loss till the manure is hauled to the field. Above all keep the manure under cover. Have it moist and compact. It is best to have stock tramping it.

(Continued on page 42)

The True Place of Commercial Fertilizer on Indiana Farms and the Permanent Effects of Its Use

By Prof. R. H. Carr.

DURING recent years there has been an awakened interest in commercial fertilizers throughout the corn belt and elsewhere. This enthusiasm is due probably to the call for increased production and the higher prices received for all farm crops. This interest was manifested, too, in the getting together for the first time of representatives from great manufacturing and commercial industries at a great educational institution (Cornell) to study soils and the proper use of fertilizers.

Invoice of Plant Food.

Many farmers are studying the amount of plant food in their soils, as revealed in crop production and are doubtful whether the average content (2,000 lbs. of nitrogen, 1200 lbs. of phosphorus and 500 lbs. of calcium) will be released fast enough to yield a profitable crop. Usually it is not and those who have made the greatest profit out of their farming have taken no unnecessary chances on plant food and have used fertilizers liberally. When an acre of ground is plowed and prepared as it should be, about 25,000 cu. ft. of soil must be lifted and pulverized in such a way as to provide a firm seed bed for the crop. This alone is an expensive operation and nothing should be omitted which might increase the yield. If only one-fourth of an ounce of a good mixed fertilizer were added to each cubic foot of soil, about 200 lbs. per acre, the chances are that the yield would be increased from one-fourth to one-half over that of the unfertilized land.

"Personality" or "Human Element" of Plant Growth.

It is impossible to tell without studying each case just what fertilizer would yield the greatest return as each crop has a "personality" which must be considered and each soil has problems peculiar to itself. For example there are many different kinds of loams and that which is called a loam in a clay soil region is often

called a clay in a sandy soil region. The fertilizers recommended for corn, oats and barley in Indiana are 2-12-4 for light colored soils (sandy and silt loams and clays), 0-12-4 for black loams and 0-10-6 for mucks.

Balanced Ration for Crops.

The confusion regarding the kind of fertilizer to apply for certain crops presents difficulties even greater than the soil problems. For example, a 7-6-7 on corn would be wasteful of nitrogen and would cause delay in the maturing of the corn or if a 3-10-0 were applied to potato ground, it could hardly be expected that the tubers would develop well. So the "human element" is to be considered and a fertilizer chosen not to feed the soil but to supplement its weakness in order that the growing crop may find all it requires. A corn plant needs a balanced food as much as the shoat that may eat the corn. Therefore after five years of experience in farming a certain piece of land, an alert farmer should know more about its weakness and fertilizer requirements for the crop he raises than any "soil doctor" could ever tell him.

Fertilizers Do Not Injure Soils.

It is not uncommon in many communities to find quite a prejudice against the use of commercial fertilizers. The claim is made that they stimulate the crops for a time, securing increased yields temporarily, but that later the soil ceases to respond to any stimulus and is "sapped of its energy." When these cases are investigated it is found usually that there are several possible causes for the poor yield, such as disregard of proper rotation, or lack of good drainage, etc. There is an abundance of evidence both in this country and abroad to prove that fertilizers may be used continuously with benefit and ever increasing crop yield. At Rothamstead, England, the largest yields of wheat have been raised of which the world has any record, averaging 36.5

bushels per acre for a period of 60 years. Only 12.5 bushels of this amount are due to the natural capacity of the land, while the other 24 bushels are due to an annual application of a complete chemical fertilizer. At the Pennsylvania State Experiment Station there is a field that has had nothing but a complete fertilizer applied for 35 years and in this case also the crop yield has been maintained and the land is plowed and worked just as easily as the adjacent field which has been receiving manure all these years. The same thing has been found to be true at many other stations, showing that when crops are properly rotated and the land well drained, chemical fertilizers will maintain a good crop yield without injuring the soil.

Increasing Soil Organic Matter.

Much has been said recently concerning the increase of soil organic matter through the larger root system and stubble which the fertilized crop produces. In this way, it is believed, the organic matter, which plays an important role in soil fertility, is maintained or increased. The West Virginia Station reports that on land on which complete fertilizer and no manure had been used for 15 years, and all crops grown had been removed, and no green crops plowed under, the organic content is 15,000 lbs. (equivalent to 75,000 lbs. of manure) greater than on the check plot which received no fertilizer. From this data and that of other stations conducting similar experiments, it would appear to be a very wasteful procedure to plow under a 2-ton per acre clover crop worth \$40 or more as a fertilizer to secure the desired organic matter and plant food when even \$5 worth of complete fertilizer would produce as large a crop as the clover. However, some years ago, the price of clover hay was very low and that of fertilizer quite high, whereas the opposite is true now. This is no attempt to depreciate the value of manure and clover as fertilizers. They have always been considered the best sources of natural fertility and rank so today, but the amount of plant food obtainable from them is far too small and must be supplemented with plant food elements from other resources to get profitable returns from most of our soils.

Fertilizers Pushing the Corn Belt North.

Corn is considered the great American crop and a fertilizer which can hasten its start, development and maturity is being welcomed. It takes 100 days or more to grow this grain and a day lost because of a cold Spring resulting in bacterial inactivity and little available nitrogen, can never be regained. A nitrogen fertilizer added to this time would give it a start and prevent delay. But even after a good start and growth, trouble often comes at the end of the ripening period because of frosts. A fertilizer containing readily available phosphorus helps to prevent this by developing the plant so regularly day by day that it ripens before time for frost. Both available nitrogen and phosphorus are needed at first to give the plant a vigorous start and later to speed up the ripening. Hence through the use of fertilizer such as 2-10-4 in liberal quantities, it is possible to grow corn and other crops much farther north than has been possible before.

Swat Plant Diseases with a Bag of Fertilizer.

Not only is the plant aided by the application of fertilizer at the beginning and end of its life cycle, but it is protected during the growing season, especially from attack by disease. The well fed and swift growing plant is much less subject to attack or to being overcome by an attack of disease than the plant that is continually struggling just to exist.

In conclusion it would seem that the use of fertilizers in Indiana and elsewhere would prove that they are profitable and that those who have prospered most in their farming have been the most liberal in the use of chemical plant food.

Now is a good time to make the excavation for next spring's hotbed and get the frame in readiness so that such work will not have to be done during cold weather when the ground is frozen.

The potatoes which the best growers are putting on the market today are proof enough that the selection of seed potatoes from the best hills in the field are much superior to seed sorted from the bin with ever so much care.

Fall Management of the Laying Flock

By J. R. Smyth, '20

THE problem of producing eggs in the fall and early winter is one of vital importance to the poultryman or farmer who is raising poultry, for this is the time of year when the price of eggs is the highest. In fact the profit from poultry depends very much upon the ability of the poultryman to produce these high priced eggs.

The two main factors affecting this early production is early hatched pullets and the way in which they are handled in the fall, as they are about to start on the laying season.

The ideal time for pullets to start laying is in October and they should be well matured before starting. The length of time required for a pullet to mature depends somewhat on the breed, but it can usually be figured from six to seven months, the time for this development being shorter for the smaller breeds, such as Leghorns, and longer for the heavier breeds. These birds if hatched early will have plenty of time to mature in a normal way, without forcing, and maturity will come at a natural time, which will mean strong, vigorous birds, well developed and able to stand the strain of heavy egg production.

They should be taken in off the range and put into permanent winter quarters a few weeks before starting to lay. This is the most critical time of a bird's career and every precaution should be taken to see that they do not undergo any sudden changes in temperature or feed. Care should also be taken to see that they do not become frightened, for any shock will retard the development of the egg for a period of time, depending upon the severity of the shock. It may also cause the hen to go through a molt, in which case it will be eight weeks or more before she starts laying again.

With these precautions in mind, plans should be made to move the pullets from the colony houses and range into the laying houses about the first of September and not later than the first of October. The birds should be handled carefully, as

a little extra time spent now will mean dollars and cents later.

By following this plan the poultryman will have a chance to study the birds, cull out the undesirable and immature pullets and thus secure a uniform flock. The birds will have time to become acquainted with their new quarters and a new ration before they are ready to start laying. They should be comfortable and contented so that all their energy may be used for development and production. It will also give the poultryman a chance to watch the growth and development of the birds so that he can if necessary retard or hasten their maturity. If they start laying before the weather becomes cold they will probably continue through the winter, but if they don't start before cold weather they will usually wait until spring, which means a big loss during the most profitable season of the year.

An important thing to avoid while getting the pullets in shape for maximum egg production is a condition commonly known as "fall colds." The main cause of colds is crowding the birds in the roosting houses without proper ventilation. Even if no colds result, birds which are forced to breathe hot, foul air will suffer considerably and will be slower in maturing. Fall colds ordinarily appear just as a case of "snuffles" with a slight rattle in the throat. The surest way to detect them is by going among the birds at night, and any bird that is wheezing is then easily located. Also, if the colds are at all advanced, a distinct and characteristic odor will be noticed.

Any birds having colds should be isolated at once in order to prevent spreading the trouble through the entire flock. In many cases the best remedy will be to remove the cause of the trouble. Perhaps the simplest remedy for colds is potassium permanganate. To use this, make up a solution by dissolving two or three tablespoonfuls of the crystals in a pint of water. Each time the drinking fountains are filled, pour enough of this stock

(Continued on page 44)

Rover's Rovings

By the Educated Dog

Dear Boys and Girls:—Gee, but it's good to be back to old Purdue again and meet all of the students that one knows and to see all of the bustle of everyone getting settled and ready to go to work



My latest picture.

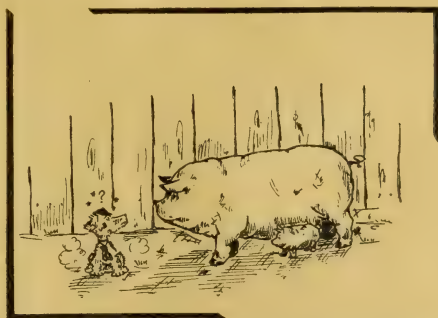
again. How my heart swells with pride when I can put on my little green cap with the yellow ribbon and strut down the street with the other Freshman Ags. Just think, folks, I am the first dog that has ever attended college and studied Agriculture. Haven't I the right to feel proud?

The summer vacation passed so quickly with all that there was to do on the farm that Jack, my master, and I hardly realized that college time was here again until the State Fair was on us. And, folks, I want to tell you about that State Fair, for it sure was some show. You know Tim, that's Jack's little brother; well, he joined a pig club last year, and Henry, that's our neighbor's boy, joined a corn club. Of course as I had been to Purdue's Boys' and Girls' Club Roundup and had studied there for five weeks I knew a lot about both corn and pigs and of course did everything that I could to help the boys in their work. Tim had fine luck with his pig, and when State Fair time came, Tiny, that was the pig's name, weighed 220 pounds. Now I knew from what I had heard the professors say that Tiny was some pig for his age and I felt certain that Tim would carry off a big prize. As September drew near

Tim spent more time with that pig than any hog is worth, but I must admit that he sure had Tiny shining, and by the day that Ezra, that's Tim's dad, loaded us in the truck and started to Indianapolis there wasn't any doubt in my mind but that Tiny would carry off the blue ribbon.

Well, I suppose that a lot of the other boys in the clubs must have felt the same way about the matter, for when we arrived at the fair and unloaded Tiny there sure was plenty of company for him. My land, I never saw as many pigs in my whole life at one time. Really, boys, there were hundreds of them, and I heard a man that they call Mr. Shanklin, say that there were 87 pigs in the boys' classes alone. Right away when I heard that I began to feel that Tim's chances were slim then I happened to remember that Tiny was not slim by any means and I cheered up.

As the pigs were not to be placed for a few days I took in all of the side shows and had a big time. All of the other dogs looked very enviously at me when I rode the merry-go-round but that didn't bother me in the least and I conducted myself courteously as an educated dog



"How long will it take a prize 6 months old pig to get as large as the biggest hog of the show?"

should do. While I was rambling around the grounds I saw a sign on an old rickety building which read "PURDUE EXHIBIT." At first I thought that Purdue surely wouldn't have to have any kind of a show in an old building like that, then I remembered that good things do not

always look the best on the outside and in I went. Those Extension and Experiment Station people sure do want to help the farmers. Why, they had a little farm all fixed up in there with little fields, barns, houses and everything all complete even to pigs out in the little clover field. Pigs must belong in all farm pictures, don't they?

In the same building there were little chicken houses with real chickens in them, there were model farm buildings of all sorts and all around were a lot of my Purdue friends explaining everything to the farmers. And will you believe it, down at one end of the little old building I met Bossy and Bess who had traveled down to the Fair to show people that it pays to own aristocratic cows. Bossy and Bess are not their real names but those were the names I had known them by at Purdue and I didn't like their real names because they had a whole string of figures on the end of them. I heard Dean Skinner say that those figures showed that they were registered and were purebred and I will learn a lot more about such things in the study of pedigrees.

After having quite a chat with my friends in that old building I wandered into another place called the Oliver Building and there found a lot more of my Purdue friends. The ladies from the Home Economics Extension Department were showing the farmers' wives all about model farm kitchens, about home nursing, about the great food value of milk and milk products and all sorts of labor saving devices for the house. On one side of the room was a lot of canned fruits from the Girls Canning Clubs and sewing from the Girls Sewing Clubs, and will you believe it, up on a platform in one end were some of the girls whom I had met last spring at Purdue. They were representing their county in the State Club contest. In three days nine of these county teams gave demonstrations in cooking and sewing to show the people the value of Boys and Girls Club work and then the winning team was picked. Say, but I'll bet those girls were happy and proud when they learned that they were the best team in the state and would get to represent Indiana in an-

other contest. I didn't know all of them but Mr. Shanklin told me that their names were Hazel Holden, Laura Kissling, Elizabeth Schaffer, and Ada Newby and that they lived in Bartholomew county. It seems to me that Bartholomew county should be mighty proud of their girls and boys as should all of the other counties that have girls and boys in club work. Why those girls actually made an apron and cap in twenty-one minutes and if they could have done that without the Club training I'd be some fooled.

Next I watched the races for awhile and then went back to the hog barn where Tim was. He was all excited for the contest was to come off the next morning and Tim said that Tiny was sure to win. I wanted badly enough for him to win but didn't feel any too sure about it. That night Tim and I went to the Coliseum and Tim said that it was better than a circus but I didn't know about the circus part as I had never seen one, but I will say that the show we saw was sure fine. We had a lot of fun that night sleeping in a tent with some friends of ours who had a lot of cattle at the fair. Next morning we were up bright and early feeding and cleaning Tiny for the contest that was to come that morning. Tim was so excited that he could scarcely speak and I got almost as excited as he did. All around us the other boys were just as excited as he was and believe me we all had a big time.

Finally after what seemed to me to be about six hours the show started and the boys began taking their pigs into the show ring. How proud Tim looked as he drove Tiny out and Tiny acted just as if he knew what was going on. Another one of my Purdue friends, Professor W. W. Smith was the judge and he looked those pigs over mighty carefully. First he backed off and looked at them and walked around them and then he ran his hand very carefully up and down each pig's back. Then he had the boys make the pigs walk around and then he felt of their backs some more. When he came to Tiny he seemed to be very much surprised about something but didn't say a word, just went right on with his work. I was sure then that Tiny would get the

prize and I was all ready to run out and congratulate Tim when Professor Smith began to speak. I'll never forget those words for they sounded like a sentence to me and poor Tim almost broke into tears. "Samuel Tomlinson of Shelby county wins first in the Poland China class" were the words. Then the names of the second and third place winners were called and yet Tim's was not in the list. Then the judge said "The black pig of Tim Harmon's is an excellent lard type and in most respects does not have an equal in the show but those very deep wrinkles in the sides are a very bad feature and keep the pig from winning or placing in the class." Tim brightened up some at that but I didn't for I had not yet learned that wrinkles in a pig's side were so serious as all that, but believe me I'll not forget it from now on. As soon as we got to the pen Tim told me that never would he show another pig with wrinkles and Tiny acted as sorry as Tim and I that he didn't win.

After awhile Tim and I went out and watched the other classes. We saw Carlton Hayworth, one of our friends, win the Duroc Jersey class, and Paul Siess, also of the Duroc Jersey class, win the \$50 herdsman's prize. My how proud those boys were and I am sure that they had plenty of reason to be proud. But



Clarence Million feels like a Billion when he beats his older competitors.

proudest of all of them was Clarence Million who swept things about right with his pig. Clarence, after having to be satisfied with a third in the pig club contest stepped right out and won the first prize in the Junior Sow Pig Class,

and then to top off his efforts won first in the open classes for Junior Champion. Clarence certainly convinced the men who competed against him that Pig Club Work pays and pays well and his success should spur the club boys on to greater efforts. The older men who competed against Clarence have substantial proof that the boy who starts his study of agriculture while he is still young is much more apt to succeed than one who waits until later in life to start. And folks, I know that Clarence felt like a real for sure millionaire after his sweep.

After all of the excitement of the fair Tim and I returned home and I rested up for a few days, then Jack and I packed our trunks and came back to get some more farmacy and it does look as if we had a big year ahead of us. I want all of you boys and girls to come up to Purdue to see me some time this year. Some of you will no doubt be at the Centennial Exhibit at Evansville for the corn, pig or canning contests and will try for a share of the \$150 in prizes. I would be very glad to hear from you at any time.

Yours for a big year,

ROVER.

THE STOCK JUDGING TEAM

The first call for candidates for the Stock Judging Team was made by Prof. W. W. Smith the first Friday of the school year. At four o'clock twenty-three men met at the Judging Pavilion for their first workout. This is the largest squad that has ever reported on the first evening, nearly all the Senior Animal Husbandry Section coming out. No cut has been made as yet and the whole squad is present every evening.

The work thus far has been the placing of fat animals. Reasons are given on each class, each set of reasons being graded to aid in picking the team.

Purdue has stood very high in the Intercollegiate judging contest held at the International. Three years ago Purdue furnished the winning team; the next year the team placed well up among the competing teams. Last year because of the war no team was sent. This year, with the interest taken and the number of men out, a team should develop that will place well towards the top.

Agricultural Education

By J. R. Stubbs

WHEN the State Fair opened at Indianapolis the week of September 1, one of the exhibits that came to the notice of thousands of people because of its attractiveness and completeness was that of the Purdue University Department of Agricultural Extension. Authorities at Purdue and all who saw it agreed that the display was one of the best the school has had at the Fair for several years and all seemed highly pleased with its success.

Two buildings, the Purdue and the Oliver, were necessary to house the exhibit, and each day these were crowded with spectators anxious to see what the university was doing. Twenty instructors were present with the display which covered nearly all phases of farm life, and during the six days of the Fair much information in the form of pamphlets and personal talks was given to thousands of interested farmers.

Perhaps the most striking feature of the entire exhibit was the layout of a miniature farm. The model was for 160 acres and the arrangement was made for a four-year crop rotation. The amount of livestock kept on the farm, the rotation used and the forage for stock were all shown on a placard displayed above the exhibit and in miniature fields. The arrangement of the fields, the location of the fences and all details concerned with the layout of the farm were shown in detail.

The exhibit of the dairy division was intended to show the cost of milk to the consumer and the pounds of feed necessary to produce 100 pounds of milk. Photographs of a few of the high producing cows in the state were shown together with some of the records that they had made. Several high producing cows were on display in the dairy part of the Purdue building, together with their offspring. The display showed the improvement that can be made in the production of milk and butter fat by the use of good pure-bred sires.

Limestone, clover, alfalfa, and corn were the four factors emphasized in the

exhibit of the soils and crops department. Alfalfa was particularly emphasized as a crop which Indiana should grow more extensively because of its high feeding and soil building qualities. A map displayed on the wall showed that the amount of clover grown in the state compared to the other crops is far below what it should be. An effort was made in the exhibit to show the farmers the necessity of using more limestone. The score card used by the Indiana Corn Growers' Association was displayed on the wall as the standard which should be used in judging all corn in Indiana. However, the fact was brought out that the score card could not do it all in the campaign for a higher production of corn and for this reason it is necessary for the farmer to practice such things as careful selection of seed, proper drying methods and thorough cultivation.

The display of the botanical department contained a placard which showed that during the past year, farmers of the state saved enormous quantities of all grains by treating their seed with formaldehyde or the hot water method before sowing. The main part of the exhibit was taken up with the display of wheat and potato diseases and the methods to follow in controlling and eradicating these.

A plan for a small farm orchard which would supply the fruit for the entire family throughout the year was the feature of the exhibit of the horticultural department. This orchard was so designed as to furnish apples, peaches, plums and cherries. The storage of vegetables for winter use, points to be considered in the growing of potatoes and the varieties of potatoes recommended for the state were other features of this same display.

Scrub livestock eradication was the main point of the exhibit of the animal husbandry department which pointed out that the keeping of scrub animals was extremely unprofitable, while the raising of pure breeds returned the owner a fair profit. A contrast between a good ration and a poor one was brought out in such a way as to show the farmer the advan-



Some of Indiana's contributions to the State Fair. A Boys' judging team in action

tage to be gained in feeding a balanced ration. Points of interest to sheepmen and men raising hogs were brought out in striking ways.

Sanitation was the detail which occupied the center of the display of the rural engineering and veterinary department. Sanitation may be insured by the use of buildings which admit plenty of sunlight and by seeing that the feeding grounds and surroundings of the barns are kept as clean as possible. The veterinary department displayed representative brands of disinfectant and pumps in connection with this exhibit which they recommended the farmer to use in connection with the campaign for cleanliness about the farm.

Joan of Arc, Purdue's 1,064 egg White Leghorn Hen, was the feature of the display of the poultry department which showed the proper steps to follow in culling a flock and the right kind of feed to give laying hens. Another part of this same exhibit was a good farm henhouse, showing the location of the roosts, nests, dropping boards and feeding boards.

The display of the home economics department, which was held in the Oliver building, was perhaps one of the most interesting features of the Fair, and an ironing board which folded into the wall, together with several other conveniences

were among those designed to lessen the labor of the farmer's wife. Proper food for invalids and the way to take care of them were among some of the other interesting and attractive features of this same exhibit.

The Purdue exhibit has been a helpful and important feature of the fair for years and always is the headquarters for thousands of farm folk who come and see and ask questions so as to get more detailed information on the various topics of farming. The Purdue exhibit always presents some new ideas in farming, but always with the view of helping drive home the fundamentals of successful agriculture.

Replace at least a part of the plant food you took off your garden in the form of vegetables this summer by applying manure when it is obtainable, or, by sowing a legume or green manure crop, such as clover over a portion of the garden area.

It is splendid garden practice to plow in the late fall after all crops are harvested and the old cabbage stumps and mats of weeds are cleaned off and burned. Insects will be noticeably decreased in numbers the following season if it is continued from year to year.

Agricultural Conditions in the Prairie Provinces of Canada

By F. K. Blair, '22.

WITHIN the past ten years the people of Western United States and Canada have had their attention attracted more and more to the rich land of the prairie provinces of Canada. They have realized that if more crops could be brought there and accustomed to the conditions, Canada would be a much more productive country. With this fact in mind they have employed men to study the conditions and improve varieties so as to produce bigger and better crops, thus making it more profitable for farmers to go there.

The men studying the conditions have found that the greatest factor to solve is that of weather conditions. The prairie provinces have an extreme climate. In the summer the weather becomes hot and dry and in the winter very cold, sometimes getting as cold as seventy-five degrees below zero in the grain-growing regions. The growing seasons are very short and the weather sometimes cold. These are the conditions that the agriculturist has to meet and overcome before he can make farming a success. He must get a crop that will mature in the shortest possible time and at the same time be able to stand considerable cold weather.

The agricultural experiment station of Saskatchewan, in connection with the University of Saskatchewan is giving a considerable amount of time and money in trying to find as many crops as possible that will meet the existing conditions. They have found certain varieties of wheat, oats, barley and rye that produce large yields per acre. Also alfalfa, timothy and clover are being grown to a certain extent. Most garden vegetables have been cultivated and grown so that they have become acclimatized to the weather conditions. Corn and fruit, with the exception of a few varieties of berries have been practically a failure.

Live stock conditions have been improved along with the crop conditions.

Many stock breeders of the middle west have seen the advantages of the Canadian prairies and have bought large tracts of land to use for stock raising. These stock breeders have changed the wild, lean, angular western steer into one with a much better beef type. Some herds have been improved until the owners have developed a line of show winners and are taking many prizes at several of the leading stock shows of the middle west. By the crossing of some of the show winning bulls with the western cows it will be possible to improve most of the western herds at a relatively low cost. With an improvement of stock will come more profit to the stock raiser. Sheep and horses have received considerable attention along the same lines. The result has been a much improved grade of animals in both classes. The Western broncos are rapidly leaving the plains while big heavy draft animals are taking their place. Sheep have not changed so much because the western breed is the only one with strong enough constitution to stand the climatic conditions. Few hogs are raised in the provinces as only the small grains are grown. This kind of grain does not take the place of corn for fattening purposes and as a result we find mostly the bacon type of hog raised.

The improvement of stock and the bettering of grain conditions have caused mixed farming to become much more popular and profitable than stock raising or grain growing taken separately. It is rapidly taking the place of the once numerous ranches because it enables the farmer to bring his stock nearer an ideal fat condition and at the same time to receive a maximum price for his grain. With both stock and grain farming in mind, the western farmer should be able to couple these two pursuits together in a very profitable way.

Dry farming has been introduced into different parts of the provinces with considerable success. The experiment sta-

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The Wheat Midge

THE past season has witnessed what, in some sections of the state, may be considered as a fairly severe outbreak of the wheat midge or as it is more popularly known the "red weevil," or "weevil in head." This name is derived from the tiny, orange colored maggots (which, however, are not true maggots in any sense of the word) and has persisted despite the attempts of entomologists to change it. While the crop in general may have been reduced only a few percent, a careful estimation of the condition was very difficult, due to the prevalence of wheat scab throughout the state. For it will be remembered that, except those grains showing actual surface discoloration by the scab fungus, the similarity of the injury upon the kernel in these two particular instances is too close for popular distinction. Midge injury was, without doubt, as high as eight to twelve percent in some localities over the state. In years past, however, this tiny insect has been known to reduce the yield from 25 to 75 percent, and at such times were so thick on the heads as, in some instances, to give them a slight orange discoloration.

Fortunately, it is found that, at the present time, its natural enemies keep it so reduced in numbers that it seldom produces really serious depredations even in limited areas. For this reason, farmers should be glad to avail themselves of the opportunity to join their efforts to those of the helpful insect army in reducing the injuries of this pernicious parasite to zero—absolute.

It is a fact of common observation that the wheat midge prefers smooth, softer wheats to the hard, bearded varieties, due probably to the fact that the beards of the latter serve as a sort of natural barrier against the adult, gnat-like, midge flies in their attempt to deposit their eggs in the opening wheat flowers at blossoming time. After bearded wheat, their preference seems to be rye, barley, and then oats.

As has been inferred, the injury to the wheat is caused by the tiny maggot

which lies pressed close against the kernel at the time it is in the milk and soft dough stage, thus drawing from the succulent kernel all the nourishment it may require to mature its worthless body. Thus, in the case of a severe infestation, the kernel will be left only as a shriveled shell, with little nutriment and weight. It is sometimes observed that the upper part of the head dies before the lower, and thus appears white above the green or healthier part. This may be due, in part, to the earlier deposition of eggs in, as well as a natural preference of the insect for this part of the head. A very important point, and one that is almost invariably misunderstood, is to be found in the connection of the midge with the grain after its maturity. It is absolutely impossible for it to produce further injury to the wheat after it ripens, though where great numbers are present upon the heads at threshing time, and more or less of them get into the bin with the grain, it is found that the mass of animal matter may stimulate abnormal "heating" of the grain, and bring about such conditions as will invite the attack of other forms of bin insects—more properly known as granary weevils. Where this condition is found to prevail at threshing time, it will be found a good plan to screen the wheat, a fanning mill serving very well, and the danger referred to above, as a result of their presence will be largely avoided.

The life cycle of the insect is relatively simple. Following the deposition of eggs—singly or in groups up to eight or ten—in the crevices or blossoms of the wheat heads, most frequently at its extremity, the incubation period follows for about a week, and upon emergence, the young larvae make their way to the tender wheat kernels. They remain thus as orange-colored maggots, and after about three weeks of continuous feeding, slip (noiselessly) to the ground and at a depth of $\frac{1}{4}$ to $\frac{1}{2}$ inch, build for themselves tiny cocoons about the size of a mustard seed. It is, therefore, only the parasitized or immature midge maggots that are to be

found in the heads at the time of maturity. In general, the insects remain in the cocoon over the following winter and issue in the spring as adult midge flies. Some of them, however, emerge the same fall and produce what has been observed as a partial second generation. The period of attack is shortened by hot, dry weather, and lengthened by that of the opposite kind.

The control measures that may be gathered from the preceding discussion and life cycle may be set forth as follows—

1. Use hard or bearded varieties.
2. Rotation of crops—since many of the flies, being very delicate, will be lost if subjected to the necessity of migration.
3. Use early maturing varieties—to secure maturity before the insect appears to lay its eggs in the spring.
4. Burning the stubble before plowing will, without doubt, be productive of good results.
5. Seed as early as possible, all other conditions—Hessian fly, etc.,—of course being considered.
6. Fertilize to stimulate rapid development and early maturity.
7. Plowing the stubble is found to be the most thorough and only really reliable remedy to absolutely destroy the insect. By this means, the minute cocoons are buried under six or eight inches of soil and the emergence of the adults thus rendered impossible. Plowing should follow harvesting as soon as possible to prevent the emergence of the partial fall brood. In case clover is present, it means the sacrifice of the sowing, versus a reduced wheat yield for the following season.

The present season found the spring wheat carrying quite as heavy infestation as the winter wheat—in some instances heavier, in fact. It is quite improbable that even the later varieties of spring wheat will be sufficiently late in their development to escape infestation by this insect.

The application of lime to the garden is valuable in "lightening" clay soils and making compounds stored in them available to plants. If quicklime is used, apply one pound to 20 or 30 square feet.

HOG "T. B." RESPONSIBLE FOR HEAVY SWINE LOSSES.

Farmers of the country could have saved approximately \$2,000 last year if all the hogs that they shipped to the market had been free from tuberculosis or "T. B." as it is commonly called. According to a report of the U. S. Department of Agriculture, this disease last year sent 25,000,000 pounds of hog meat into the condemned tanks of the Federally inspected slaughter houses. In one year, more than 66,000 hog carcasses have been sent into the fertilizer tank. These facts show that hog tuberculosis is causing thousands of farmers to turn their corn, alfalfa, concentrates and skim milk into low-priced soap grease instead of high-priced pork. For this reason every farmer should take all precautions possible to eliminate this disease from his herds.

Hog tuberculosis is contracted chiefly from tubercular dairy cows. The germs carried in the body of the dairy animal are excreted in droppings or milk or she may cough them out on feed or bedding. It is from these germs which the hogs pick up that they get the disease. Pasteurized or cooked milk will not pass the disease from infected cows to other animals. The ways to prevent the disease in the hog herd are as follows:

See that all milk, especially skim milk from the creamery, is cooked before it is fed to the hogs.

Keep the hogs from following dairy cattle unless the animals are tuberculin tested. Keep them out of cow lots and barns and keep dairy drainage out of hog lots. Hogs may, however, follow steers without much danger.

Healthy hogs should be given a chance to remain so. Give them clean, well-drained lots and plenty of fresh air, sunlight and clean water. Shelter them in well-lighted and ventilated, sanitary hog houses. Keep the houses clean and use plenty of whitewash and disinfectants.

If there was tuberculosis on your swine last year, it is safest to get rid of that herd, especially the breeding animals, and raise clean hogs from healthy stock.

The farmers' expletive—"My Land."

Select Your Seed Corn Now

THE average yield of corn per acre in Indiana for the past ten years is 36.8 bushels. This is far below the possibilities. One of the easiest ways of increasing this yield is to secure better seed. Better seed means a better stand, stronger plants, and a better prospect of a good ear on each stalk. One's first thought may be to buy seed of a reliable seedsman, but corn is so sensi-

little competition to show its worth. Select a sturdy upstanding stalk of medium height bearing a good ear at a convenient husking height. An ear which is borne high is usually late maturing. Choose a stalk free from smut. The ear should hang tip downward from a strong unbroken shank.

Then we come to the desirable characteristics of the ear itself. For Indiana



A good type of ear to select from

tive to climatic and soil conditions that seed from a distance of even thirty miles north or south seldom does as well as home grown seed. If one is growing a standard variety for his section, he had better select seed from his own fields.

Seed selected from the crib is inferior for two reasons. First, one cannot tell anything as to what kind of a stalk bore the ear. Second, the corn has most likely been subject to freezes before it dried out, which means lowered vitality.

Seed selected at husking time has also been subject to freezing. Furthermore it wastes the time of huskers and teams, and they will seldom take enough care, for the rush to get the corn cribbed is then on their minds.

So there is only one time to select seed corn, and that is as soon as the corn is mature and before the first freeze. With a sack swung from your shoulder start down the row and select your seed carefully. Be sure to gather much more than you need. Avoid ears from hills having only one stalk. The plant has had too

the desirable length of ear varies from eight inches in the northern part, to ten inches in the southern part. A good ear is cylindrical in shape having a circumference of about three-fourths its length. The rows should be straight and fairly close together. The kernels should be deep and well dented. A kernel of a medium sized variety should measure about five-sixteenths to three-eighths of an inch in width, one-half to five-eighths of an inch in depth, and one-sixth of an inch in thickness. The germ should be large and the tip well developed. The tip of the ear should round off rather than taper, and be well covered, if possible, with fairly large grains. The butt should be strongly rounded out, but neither larger nor smaller in diameter than the rest of the ear.

When the ear is broken off, the shank end should appear fresh and greenish white in color. A brownish discoloration indicates corn root rot, a disease that

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Dairy Industry of State Experiences Steady Growth

An increase in the number of cream shipping stations in the state from 153 in 1914, to 1,262 in 1918 is shown in the Fifth Annual Report of the Creamery License Division of the Dairy Department of Purdue University. These figures represent an increase of 725 percent in four years and are indicative of the steady growth of the dairy industry in the state. The growth has been even more marked the past year. During the same time, the amount of creamery butter produced has increased 40 percent. Further proof of the growth of the dairy industry is contained in the fact that during 1914, the territory represented by Crawford, Perry and Harrison counties had only two shipping stations, but during the past year, there were 64 stations in these three counties. The number of testers' license has increased 400 percent in the past four years.

All creameries, condenseries, milk plants, etc., in Indiana that are licensed, report to the Creamery License Division each year concerning their output of dairy products. The reports from 1914 to 1918 inclusive show that the total dairy products listed represent 41,000,000 pounds of butter fat alone. Statistics show a big increase in the volume of all products. The amount of creamery butter produced in the past five years has steadily increased to 40 percent since 1914. During 1918 the increase amounted to 5.6 percent or 1,986,050 pounds. For 1918, condensed milk shows an increase of 13,288,914 pounds or 81.6 percent and milk 21,713,768 pounds or 5.6 percent. Licensed plants manufactured 470,597 more gallons of ice cream in 1918 than in 1917.

A total of 8,500,000 pounds of butter-fat is reported to have been shipped out of Indiana in 1918 or about 1,400,000 pounds more than was shipped out in 1917. The butter-fat shipped into the state to some extent offsets the amount shipped out, but only partly so, as only a few of the larger creameries are located near the state's borders, while several large cities located near the boundaries

receive large shipments of dairy products from the various plants and farmers.

The accompanying map shows the location and the number of factories and shipping stations over the state. A decided increase in the number of creamery licenses given during 1918-19 have been due to the fact that 524 new shipping stations have been established, an increase of 71 percent in the number of licenses issued to shipping stations alone. The number of butter and ice cream plants has been slightly decreased while the number of condenseries remained the same. During the past year licenses have been issued to a total of 1,411 dairy manufacturing plants over the state.

From these statistics it becomes evident that the dairy industry of Indiana has experienced a steady growth. The increase in production, of dairy products for 1918 was greater than was expected in view of the fact that stock feeds have been unusually high and labor and necessary equipment have demanded unprecedented prices.

The Creamery License Division serves as a representative for the farmer and for factories which buy milk or cream on the butter fat basis. While the legal duty of the division is to insure honest and reliable butter-fat tests by enforcing the provisions of the Creamery and Testers' License Law it makes it possible for the producer or manufacturer to know whether or not correct tests have been made. This service is enlarging and is more generally utilized, probably, as a result of increased competition on the part of manufacturers with the continued development of the dairy industry. Correct tests are generally given, but it is occasionally found that a tester pays for milk or cream on an incorrect basis. The proper practice in this case is effected by educational means or by prosecution. When prosecution is necessary, the violation is reported to the prosecuting attorney whose duty it is to institute proceedings against the person or persons according to the state law.

School Lunch

By Gleela Ratcliffe, '20

FOR the mother of the child attending school, at the present moment perhaps there is no more important question than that of the school lunch. All over the country mothers are wanting to know "What shall I put into Johnny's lunch basket?" Five times a week does get rather wearing, but that same daily lunch is going to prove a large factor in your child's success in his school work. Unless properly fed, children are dull in their school work. Unless properly nourished, there will be inferior school work done. Too often the lunch consists of something left from breakfast plus pie or cake hastily wrapped, perhaps in an old newspaper.

The strain of school work added to the demands of rapid growth makes the subject of food during the school year of intrinsic importance. Probably the most critical time of a child's life, so far as its nutrition goes, is the school period, between ten and fifteen years of age. Experiments have been carried on to test the value of proper nourishment, and it has been found that the children brightened up, their general carriage changed from listless depression to alert interest. In Indianapolis during the last school year an interesting experiment was carried on by the City Home Demonstration Agent. Milk was served to the younger children in the forenoon. It was served in half-pint bottles and drunk by means of a straw; the straw being a novelty induced more to drink. Marked improvements were made by the children. What rural community could not afford such an experiment?

For the younger child a forenoon lunch is desirable. In Philadelphia since 1894 a forenoon lunch is served at 10:30 during the recess period. The lunch consists of a simple dish, such as bean soup, rice pudding or milk toast, and is sold for one cent. The lunch box might provide for this morning lunch. Such menus as the following would be suitable:

- (1) Glass of milk with crackers;
- (2) Whole-wheat bread and butter with dates;

- (3) Buttered graham crackers;
- (4) Buttered oatmeal crackers;
- (5) Date sandwiches.

In the rural district there is the question of the cold lunch. A growing child needs good, wholesome food which is easily digested; therefore, the cold lunch must not lose sight of this. The wholesome foods for the lunch are milk or cocoa; good sandwiches—two kinds rather than two of one kind; fresh, canned or dried fruits; rice pudding; baked custards; eggs, hard boiled and chopped fine, for sandwiches; bread and cookies with nuts and fruit; green vegetables (if possible) and small amounts of home-made candies.

In the country if there is any cooperation between home and school there should be at least one warm dish served at the noon hour. This may be done cheaply and without requiring much time in preparation. Where cooking is taught very little additional equipment need be bought and the class may do the serving. A suggestion for carrying on this work: A monthly schedule of materials needed may be made out and sent to each family. Each mother knows just what she is to furnish for a certain day. Some communities prefer to raise a certain sum with which the teacher may buy all the supplies needed. If there is no cooperation between school and home, a thermos bottle lunch box can be used with great satisfaction. These may be purchased for \$2.50 or less. The initial cost may seem large but would be more than repaid in the added efficiency of the child. A variety of hot dishes may be easily prepared: creamed dishes, such as potato and potato soup, baked beans, cocoa, custards, eggs, macaroni and cheese, etc. Some suggestive menus with one hot dish (to be prepared at school) are as follows:

1. **Potato soup**, meat sandwiches, orange, sponge cake.
2. **Baked beans**, bread and butter sandwiches, fruit sauce, molasses cookies.
3. **Egg sandwiches**, **stewed apples**,

plain cake, prunes, stuffed with cottage cheese.

4. Brown bread and sandwiches, **custard**, apple and raisins.

A little Kansas school ma'am one day said to her boys: "If you will catch a rabbit I'll fry it for your lunch." The boys took her at her word, and the lunch was so successful that it was easy to adopt the plan of having one warm dish each day. An oil stove, not in use, was borrowed from one family, a few utensils were purchased and families asked to contribute certain articles of food. The teacher found her experiment successful, interesting and valuable.

An Illinois bulletin says the following in regard to equipment: "The amount of equipment depends largely upon the community and the number of pupils to be served. Individual equipment, such as soup bowl, cup, plate, spoon, knife, fork and paper napkins may be provided from home by each pupil. If preferred, cups and saucers made of white porcelain enamel ware of the Swedish white and white enamel ware may be furnished by the school. These may be used for preparing and serving food. For instance, the cups may be used for baking custards and eggs or for serving soup and cocoa. The saucers may be used in place of plates. Paper napkins may be provided by the teacher at ten cents per hundred.

The cooking may be done on the heating stove if it is adapted to that purpose, or an oil stove with a portable oven may be secured. An ordinary kitchen table may be used, supplemented by a portable or a home-made cupboard for utensils. More room may be secured by the use of trestles and smooth boards so arranged as to form an upper and lower shelf. These boards may be covered with oil cloth or wrapping paper. This table may be placed so as to serve for a counter as well as a working table."

The children should be taught to wash their hands each time before eating. The lunch should be arranged on the desk or table in an orderly manner. It is a good plan for each child to have an extra napkin to spread his lunch upon.

*The use of Paraffin and parchment paper has increased the number of foods

that may be carried in the school lunch. Moist foods may be wrapped so that they do not stick to other foods. Paper cups, jelly glasses, and so on, are also a help, for in them sliced raw fruits, stewed fruits, custards, cottage cheese and other half-solid foods can be carried.

The quantity of the bread used in the basket lunch is especially important because it is commonly served in the form of sandwiches and is, therefore, to be considered not only as a food in itself but also as a means of keeping other much-needed foods in good and appetizing condition, or of serving them in attractive ways.

Variety of breads, too, is more important at this than at any other meal because of the danger of monotony. Wheat bread, whole-wheat bread, corn, rye, or oatmeal bread; nut, raisin and date breads, beaten biscuit, soda biscuit, toast, zwieback, and crackers may be used in turn to give variety. Rolls hollowed out can be made to hold a large amount of sandwich filling, which is an advantage at times.

The best containers are those which are easily cleaned and also which provide for ventilation. Metal pails and boxes are easily cleaned, and if necessary, small holes may be punched in them to provide for ventilation.

In packing the lunch basket put at the bottom the things least likely to crush, and wrap the sandwiches, etc., into neat parcels, not all in one.

A wealth of material on the school lunch may be secured for the asking. The following list will be a help to the interested mother. Address envelope as follows:

U. S. Dep't of Agriculture, Washington, D. C., and ask for Farmers' Bulletin No. 712.

"Diet for School Children," by Geraldine Hadley, Dep't of Agri. Extension, Purdue University, W. Lafayette, Ind.

"The Rural School Lunch," by Florence Harrison and Olive B. Percival, University of Illinois Extension Service of Agriculture and Home Economics, Urbana, Ill.

*Farmers' Bulletin 712.

The 1919 Apple Show

H. H. Swaim, Secretary Indiana Horticultural Society.

THE annual apple show has achieved the distinction of being regarded as an Indiana institution—something to be looked forward to as an opportunity for citizens, particularly those interested in horticulture, to get together and exhibit their products as a means of marking the progress of another year and setting a standard for the next year.

ing and marketing under conditions dictated by thorough study of the demand.

Boys and Girls Have Classes.

The boys' orchard club class and girls' canning club promises to be popular features of the show this year. In the boys' club class the prizes will consist of valuable merchandise, such as fruit trees, spray material, ladders, pruning tools,



The 1919 Apple Show

The ninth annual apple show will be held the first week in November at Tomlinson Hall, in Indianapolis, and it is not too early for every grower to begin making plans for their exhibit at this annual event.

The society is responsible for the statement that these apple shows have put the state on the apple map. The growth of the industry in the last ten years, and the increased popularity of Indiana grown apples tend to bear out this claim. The state is not first in the apple industry, but on the score of quality, and to a lesser degree, quantity, it is rapidly forging ahead of the point where Indiana apples will have no equal. This has been accomplished by intelligent care of trees, by intelligent planting, and by careful pack-

etc. The girls will be awarded cash prizes. This is a new feature of the show and can be made one of the most attractive parts if the young people bring in a large number of exhibits.

Show is Educational.

The show can be made to serve an excellent purpose in attracting attention to Jamaica, devastating the entire banana the state as an undeveloped orchard district. There is at present a vast acreage of untitled land which could easily be converted into profitable orchards. The business requires some knowledge of horticulture, some money, and a great deal of patience, but it pays well, not only in money, but in the satisfaction which comes of growing a superior product

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The Banana Industry in the U. S.

By F. C. McConnell '20

THE origin of the banana and the time when it originated are practically unknown. The researches of science fail to disclose these points and lead back into the formative periods or ages of the earth's development, even before the advent of man. It is believed that primitive man of the tropics found the banana had anticipated him and that the new king of fruits was among the first indigenous plants of mother earth to be cultivated by him.

Since the wild species of banana now to be found in the tropics, and which botanists agree fairly represents the original banana, are almost wholly seeds, the plant in its original form must have been of little value as a fruit producer and it is therefore presumed that it was first cultivated by man as a root crop, and that the tender heart of the stalk was also used as an article of food. Indeed the root and stalk are even today used by the natives of some regions.

It is believed that man first came into contact with the banana in the Indo-Malayan, or tropical regions of southeastern Asia. From that region man carried it eastward and westward until it practically encircled the globe, in the tropics, finally reaching the West Indies and Central America which are the sources of the great commercial crop now imported into Europe as well as the United States and through the latter to Canada.

Development of Banana Industry.

Though the new king of fruits was flourishing in the tropics all during the infancy and growth of our government, yet on account of its highly perishable nature, it was not until the advent of steam navigation that its importation in any considerable quantities became possible.

The first importation of bananas into the country was through the port of New York, on a very small scale, in the late sixties. Thereafter other eastern ports received small shipments but it was a couple of decades before the industry received much attention. During this period bananas were regarded as a curiosity

and luxury and unknown to the people in the interior.

During the next twenty-five years, owing to gradual improvements in transportation in the tropics, on the ocean, at home, as well as to the increase in available supply brought about by cultivation and introduction of sanitary methods, importations steadily grew until in 1898 they amounted to 12,000,000 bunches. From that date rapid increase has been made both in shipping facilities and available supplies and yet though more than 50,000,000 bunches reached our shore in 1916 and probably more in 1917, the importers have been for months unable to supply the demand, so great is the popularity and acknowledged value of the banana.

Methods of Shipment.

In the early days of the banana industry the pioneer importers in securing their fruit were limited to what could be raised very near the river and smaller streams as the transportation methods were such as to permit the fruit being carried only a short distance before reaching the steamer, since the fruit must be shipped within 24 hours after being cut. In the early days a few bunches were placed on the backs of small donkeys and transported to the streams where they were loaded on to small boats and carried to the steamer. Now, the United Fruit Company alone has under cultivation more than 150,000 acres of bananas in the Central American countries. Through these large plantations run railroads, to which on either side run tramways or feeders. There are three essential requirements for carrying from the plantation this King of Fruits and delivering it in a merchantable condition to the dealers 2,000 miles away. These three requirements are speed, careful handling and correct temperature of fruit enroute.

The old method of loading and unloading bananas was by hand altogether. Now the Banana Loading Conveyor and Unloading Conveyor do away with this

inefficient method and greatly shorten the time required for these operations.

In loading, great care is used and every bunch is subjected to a rigid inspection before it is allowed a berth in the steamer. In describing the loading of a steamer and speaking particularly of the inspection of the fruit, Frederick A. Adams, in his "Conquest of the Tropics" says:—"In a few hours the docks are piled with rejected bananas. A New York or Chicago push-cart man would weep bitter scalding tears at the sight of this seeming wanton destruction of perfect fruit. All bunches showing the very slightest tendency towards premature ripening are discarded."

The worst and chief enemy of the banana crop is the severe tropical storms to which it is subjected frequently, the accustomed time for these to occur being March or April, and August or September of each year, near the vernal and autumnal equinox. On Aug. 15th, 1916, a terrific hurricane struck the island of crop, amounting to some 8,000,000 bunches.

Banana Varieties.

While to the public a "banana is a banana" except as they vary in size, there are a number of varieties of the fruit with properties peculiar to each. Limon, Chauguanolla, Barrior, Tela Guatemala, Cortez, etc., are some of the names of the different varieties.

Not only are the bananas subjected to a rigid inspection when loaded, but they are also inspected again when unloaded. It is as hard for a bunch of bananas to reach our shores through the port of entry as it is for an emigrant to pass through Ellis Island. But it is only by these modern methods, careful inspections, and close attention to every detail that this gigantic business may be conducted satisfactorily to all concerned.

Bananas are distributed in our own country in banana cars which are refrigerators on wheels. In winter they are warmed by steam from the engines; in summer they are cooled by ice.

When the banana in its green condition reaches the jobber it is then up to him to ripen it properly in order to turn out just as much ripened fruit per day as

his sales call for, subject to the time limit beyond which it cannot be held. To turn out the ripened fruit as required, several banana rooms are provided by the dealer, so that different temperatures may be maintained and a great deal of expense and careful attention are required on his part to produce fruit of a beautiful golden yellow color.

The banana is the only fruit that is supplied to the market continuously, direct from the plantations, day in and day out, year in and year out. It never goes to cold storage, nor is it put in cans as are so many fruits to extend their season, for the banana has no season, it is on the market fresh 365 days in the year. Therefore eat bananas, they are cheap, nutritious, easily digested, always in season, and are always available.

RECORD JERSEY CATTLE SALE.

All records of auction sales were smashed on September 13th, 1919 when Yoder Brothers of Middlebury, Indiana, held their dispersion sale. Forty-one head sold for \$19,175, making an average of \$467.68 per head. Buyers from five states were present to buy cattle.

M. S. Yoder and sons started in the Jersey business a few years ago in a modest way and the animals sold in their sale were practically all bred by them. They are real dairymen, found out the value of good bulls early in their breeding operations and made a consistent development by keeping records on all their cows. Among the cows owned on this farm was the highest record Jersey cow in Indiana and also the highest record three-year-old Jersey heifer.

The highest price obtained for any one animal was \$2,060.00 for a two-year-old heifer. The herd bull brought \$1,850.00. This bull, Sophia's Premier, was bred by Hood Farm, Lowell, Mass., and undoubtedly is one of the greatest Jersey sires in the country. His oldest daughters had just freshened and were the choice things of the sale and were sold for prices ranging from \$400.00 to \$600.00 per head.

Lazy people have no right to complain—busy ones haven't the time.

Vocational Agriculture in Indiana

By Z. M. Smith,

State Supervisor of Agricultural Education

A FOUR year course in vocational agriculture has been organized in sixty-two high schools in Indiana. The course is established and maintained in each case as a department in the township, town, or city high school. Pupils who complete the course receive a commissioned high school diploma with the same valuation of credits as the diploma awarded to pupils who complete the traditional college preparatory course.

Practically one-half of the four year course consists of agricultural subjects. Pupils devote one-half day consecutive time to these subjects. The other half of every day the pupil devotes to two academic subjects. The vocational teacher, therefore, has two groups of vocational pupils. He has one group all of every forenoon and another group all of every afternoon. These pupils must be over fourteen years of age and must be preparing to engage in the occupation of farming.

The half day the pupils are under the direction of the vocational teacher is devoted to class room, laboratory, field, and home project work. Such an arrangement of the daily schedule makes it possible for the teacher to adjust his program from day to day to make the work conform to seasonal sequence requirements and to insure maximum practical results in the farm practice work involved in the home project, and other forms of field work. If the vocational teacher so directs, his pupils may remain at home and give their time to their home project work the whole half day. The half day consecutive time schedule provides a flexible program for the vocational teacher and his pupils without in any way interfering with the organization and management of the school as a whole.

The vocational teacher is not employed to organize and supervise the club work. However, he can give personal supervision during the academic vacation period and on Saturdays during the school year to a large number of boys in addition to his vocational pupils. Inas-

much as supervision of club project work is an excellent means of developing interest in vocational education and of acquainting boys and adults with the nature and purpose of vocational courses in high school, the vocational teacher is authorized by the state board of education and is urged by the state supervisor of agricultural education to organize clubs and supervise the project work of club members. However, club supervision must not be done by the teacher to the extent that it in any way interferes with the educational interests of the vocational pupils.

A school corporation that desires to establish a vocational department obtains from the state supervisor of agricultural education an application blank and makes formal application for the work. If the application is approved by the state supervisor, he recommends a teacher. As soon as the man is secured, the state supervisor supplies the contract forms and completes the arrangements for establishing the vocational department.

The vocational teacher is under the supervision of the local school authorities the same as is any other teacher. But, since the state reimburses the school corporation to the extent of two-thirds of the vocational teacher's salary, the state supervisor of agricultural education keeps in close touch with the teacher and from time to time offers suggestions relative to needed improvement in methods of instruction and concerning other matters of importance in connection with the work.

Vocational education had a very substantial beginning in Indiana before the Federal Vocational Education Act, known as the Smith-Hughes Law, was passed. No changes in the requirements of our state vocational educational law and the general organization and supervision of vocational work were necessary in order to meet all the requirements of the Smith-Hughes Act. Therefore, we do not have schools in Indiana known as Smith-

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Mulching Wheat

Prof. M. L. Fisher.

IN the last few years considerable interest has been aroused in the probable benefit of mulching wheat to increase the yield. Very little experimental work has been done to show the good or evil of such practice. Some farmers have done it with good success, while others have had failure for their efforts.

Mulching consists in scattering straw, manure, or stalks over the surface of the ground early, just before winter sets in. The greatest drawback to mulching is the liability of smothering the plants. There is danger of putting on the mulch too thick and covering up the crowns of the plants so that the new growth cannot get out in the spring. This is especially true where manure is used. Manure is usually more or less chunky, and even though a spreader is used small chunks fall on top of the crowns and thus prevent their growth. Coarse dry straw is by far the best for mulching. If thinly spread the plants will grow up through it without difficulty; the danger lies in spreading it too thickly. The writer believes that if mulching is done just after seeding before the wheat comes up the best results will be obtained. The young plants will then find their way up through the straw and not be hampered. The manure spreader with a straw distributor attachment is the very best thing for scattering the straw.

The benefit of a mulch is twofold. In the first place it will protect the wheat from excessive freezing. Wheat is frequently frozen dead during a cold spell in winter when the ground is bare of snow. A slight mulch renders a great deal of protection at such a time; also, alternate freezing and thawing in the spring, which does wheat so much harm in this climate will be checked by a mulch. A second benefit from mulching is the conserving of moisture in the spring. Very frequently there is a dry spell in March or early April when the ground dries and cracks open and injures wheat greatly. Where a mulch has been spread this drying out is largely

prevented and the benefit of the mulch is very apparent.

Perhaps a word further about the material used as a mulch will be beneficial. As indicated above dry straw is best, corn stalks are good, but usually not available, stable manure adds fertility and thus stimulates growth, but owing to chunkiness is apt to do more harm than good, unless spread very thickly before the wheat comes up. In the use of straw one precaution should be observed; straw infested with jointworms and spread over the field will simply distribute the jointworm in the crop. The pupa of the insect is contained in the stem of the straw and hatches in early spring; by spreading such straw one gives the insect the very best opportunity to do its work.

180 MEN OF THE A. E. F. BLINDED.

One-third of American soldiers blinded in the war are now in training.

Latest reports give the number of the A. E. F. blinded in the war to be 180. Re-education means much for this class of men, and about one-third of these blinded soldiers are now availing themselves of the opportunities for training under the direction of the Federal Board for Vocational Education.

Poultry raising has been tested and proved to be a lucrative vocation for blind men. With the assistance of members of their families these blinded soldiers are making good at it. Osteopathy and massage are attracting others as occupations desirable for the blind.

The policy of the Board in building upon the past experiences of disabled soldiers in fitting them for future employment is adhered to in its dealings with the blinded. In following this policy, an insurance man and a druggist are training in their old lines of work, learning to "carry on" in the old way in spite of their handicaps. These men have lost their sight, but they still retain their ambitions and their grit.

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

THE OLD AND THE NEW

THE University opens for another year of work with a far different outlook and under much different circumstances than it ever has in past years. The attitude of both faculty and students has changed very materially within the past few years, and anyone who has given the matter serious thought will declare that the change has been for the better. It is also very evident that the change of University attitude is but a sample of the change that has taken place in the minds of the farmers, the great body of thinking people that is the mainstay and backbone of our nation, the safety valve between the Bolshevik and the sluggard.

In the years before the war people realized in a general way that a college education was a good thing and that the great body of college students were those who had enough money to attend college without serious financial inconvenience. Of course then as now there were those students who were compelled by circumstances to earn most or all of their way through college. For exactly that reason they were, almost without exception, the ones who appreciated to the greatest degree the advantages to be derived from a higher education.

With the coming of the World War a very large per cent of college men, both

graduates and underclassmen, answered their country's call and entered the ranks of the nation's fighting forces. Obedient to the advice of the nation's leaders, a great many students, especially the younger ones, remained in college preparing themselves and awaiting the time when they would be most needed by their country. Many of these young men were called later, while many of them were not. Most of those who were not called will leave the universities next spring to take their place in the ranks of the workers for better things. As a rule they will appreciate their education and will make the most of it.

Now we come to the largest per cent of the present students, composed mainly of those who are entering for the first time, with a fair sized sprinkling of those who are returning to college after an extended absence, either in the army or other war work. Many of the entering students have also had army experience. All of the men who have been in the service and are returning realize from their experiences the great need and value of an education and there is not the least doubt but that they will make the most of their chances. There is, however, danger that those younger students who have had neither army nor university experience, will, due to laxity of the present time following the nerve racking

strain of war times, fail to see their duty to their country and themselves and not make the most of their opportunities.

In the same way the farmers must not fail to realize that the conditions of today are very different from those before the war, and furthermore that they never will again be the same. Competition becomes more strenuous every day, and he who will succeed, be he farmer or student, must be up on his toes and ready to grasp every opportunity that comes his way—even make opportunity. He must let no day pass without gaining a point or sooner than he realizes he will find himself among those cast aside in the struggle for "Survival of the Fittest."

WHY NOT A PURDUE BUILDING?

At the Indiana State Fair, which is held every year at Indianapolis, Thursday is designated and set aside as "Purdue Day." On that day, hundreds of alumni and friends of the University gather there to renew old acquaintances, talk college experiences and get new ideas from the "Purdue Exhibit." The exhibit at this year's Fair was the greatest that has even been put up. The State Fair Association should be deeply indebted to such institutions as Purdue for the cooperation which they receive in making the Fair a success. Purdue's display was the outstanding institutional exhibit of the fair in every respect except the building in which it was held. It is putting it mild to say that the old Purdue Building on the grounds is a disgrace. Not only is it entirely too small but it hasn't been kept up—the roof leaks and no paint has been applied recently. Why doesn't Purdue have a thoroughly modern, up-to-date structure on the grounds, one large enough to decently accommodate the large display which such an institution can make and one which at the same time will be a credit to Purdue? A building which will accommodate all such institutional exhibits is being considered at the present time by the Fair Association, in which Purdue will have space. We all know the need of a new structure, but considering, that outside of the Public Health Board of the state no one institution can furnish an exhibit which can

equal Purdue, why not have a Purdue Building—where all the "old guard" can congregate when attending the Fair?

INDIANA FEDERATION OF FARMERS' CAMPAIGN.

It is no longer a question of whether the farmers of Indiana will organize or not. They are organizing in a fine way. They must follow the order of other classes of men in organizing on the line of their interest. The three great causes for the farmers to organize, as set forth by their official organ of the Indiana Federation of Farmers, "The Hoosier Farmer Organized," are:

"For mutual protection as any other class of workers and producers. To protect themselves against exploitation in the line of their products. In other words, to have the same standards of justness and fairness applied in the cost of producing and selling as any other class of producers.

To promote farm home betterments and the general interest and welfare of farm communities.

To preserve and extend our civil and religious institutions. We will stand for law and order."

A campaign to raise \$200,000 is just closing and its success is almost assured. Benton County was the first to go over the top with their quota. This fund will be used to further the plans of the organization for the next three years. This association is one that no farmer can afford to be out of. The ideas which the association hopes to carry out are very commendable and it is to the interest of every student of Agriculture to keep in touch with this movement. Get acquainted with the organized idea for the farmer. Help make Indiana's Federation the model for other like organizations.

It were not seeming to think you're the only man in the world, but try to think you know one mighty good one.

Strawberry plants and fruit trees may be set out this fall; however, spring is considered a better planting season in Indiana, because of the severe variable winters.

PURE BRED SIRE CAMPAIGN.

The Bureau of Animal Industry, U. S. Department of Agriculture, in co-operation with the agricultural colleges of the various states will inaugurate a campaign for the placing of pure bred sires on all live stock farms. The hope of this campaign is to stimulate interest among live stock breeders, so that scrubsires may be replaced with pure bred animals of good breeding and high quality.

It is found that the larger number of sires on farms throughout the country are of low grade and of undesirable type and breeding. It is found, too, that a large number of the sires have been secured from the stock yards and little attention has been paid to their selection. Since the sire is rated as more than half the herd it is most important that attention should be given to his selection.

Indiana has been interested in this work for a long time. Special campaigns have been carried on by the college in various ways. The record sales of cattle, hogs and sheep during the past year are indicative of the demand for pure bred animals. Perhaps nowhere in the country is there any state with a larger number of breeders or pure bred animals than can be found in Indiana. These breeders are producing high class stock and are able to furnish a large number of desirable animals to be used at the head of growing herds.

At the conference of county agents and other extension workers to be held by the Extension Department of Purdue University, October 14-17, special attention will be given to plans for furthering the pure bred sire movement for Indiana farms.

ARE COUNTY AGENTS BUSY? READ THIS.

Here is a week in the life of an Indiana County Agent taken from the weekly report of Stewart Leaming, of Jasper county: "Obtained men for Dexter and Rush; Amsler called in regard to selling his land. Wrote up newspaper articles and classification for stock show; visited boys in corn and pig clubs; took samples of soil for Crisler and Weiss and tested them; went with Mr. Minnear and gave suggestions for handling Bachman farm; went to Barkley to arrange for livestock

shippers' meeting Saturday night; arranged for livestock show committee meeting and attended it; went to Wood's in regard to exchange of boar; solicited entries in stock show from Hereford man; saw Rush and Battleday in regard to cattle feeding demonstrations; helped Bell select entries for show; saw Kosta in regard to shippers' meeting; handled correspondence, attended shippers' meeting."

In doing all these things, which included working up interest and enthusiasm for the county livestock show, helping get the livestock shippers' organization on its feet, and a few more things, Mr. Leaming drove his automobile 200 miles, held two meetings with a total attendance of 29 farmers, saw 22 other men on their farms, saw 20 farmers who came to his office, wrote 17 letters and visited two of several dozen in demonstrations which members of the farmers' organization are co-operating to show better methods in agriculture.

PROF. P. S. LUCAS COMES TO PURDUE

A new member was added to the University Staff with the arrival of Prof. P. S. Lucas, on September 1, from the Oregon Agricultural College. Prof. Lucas graduated from Purdue in 1914 after which time he worked with the Atlantic Sanitary Milk Co., of Omaha, Neb. In 1915 he again came back to Purdue as a member of the Experiment Station Staff where he remained until January 1916 when he left to become Assistant Professor of Dairy Manufacture in the Dairy Department of the Oregon Agricultural College. Prof. Lucas is a specialist in cheese manufacture and market milk and will devote much of his time while here to the teaching and investigation of these subjects in Indiana. He holds the titles of Associate Professor of Dairy Husbandry and Assistant Professor of Dairying.

On October 1 W. O. Mills, better known as the "Red Headed Dairyman of Indiana" will sever his connections with the Dairy Extension Staff of Purdue. Mr. Mills is a graduate of the 1913 Class of Purdue and immediately after gradua-

tion went to work on a farm for a year after which time, on August 1, 1915, he returned to Purdue as a member of the Dairy Extension Department. His chief work during the past four years has been the organizing of bull associations, planning and staging fair exhibits, and conducting dairy trains and short courses.



W. O. Mills.

His travels about the state have made him a host of friends, for his congenial manner, his knowledge of dairy subjects, his winning smile and good stories will never be forgotten by those with whom he has been associated.

Mr. Mills has leased his father's farm and is leaving Purdue to enter upon the business of raising pure-bred Guernsey cattle. He made his initial start in the Guernsey world at the State Fair this year, winning first place in the futurity class. The best wishes of the entire university community go with him into his new venture and many regrets are expressed at his leaving.

Cabbage that is in danger of being caught by frost may be made into kraut by salting down in an earthenware or wooden vessel.

Tulips and other hardby bulbs planted now and covered with a few inches of straw after the ground freezes will bloom perennially, beginning early next spring.

MAKING INDOORS CHEERFUL.

It is well along toward the time when the porch or veranda is too cool for pleasant relaxations. We turn then to the more temperate interior of our home; the warmth of the fireplace suggests greater comfort.

This then is the time to "cheer up" the interior—to put everything in shape for the long winter months. Too much time has been spent in summer in keeping comfortably cool to give much attention to interior decoration, but being indoors brings forcibly to attention the fact that everything is not as bright and cheerful as it should be; walls, floor and woodwork need retouching to bring back the comfort and cheer that nature has heretofore furnished.

A coat of flat wall paint will impart a restful appearance to the walls. Its washable and sanitary features, the efficient lady of the house will appreciate.

The floors should be treated with a coat of good floor varnish, the kind that will stand scrubbing and not give way under rough usage. If it is a waxed floor, an additional coat of wax will renew the velvety lustre.

Attention should also be given to the woodwork and doors. Varnish them with interior varnish. The results will be surprising—a brightness that fairly radiates its cheer. Of course, if the woodwork is painted or enameled, apply a coat of material previously used.

We should not stop with the building. There is still the furniture to be considered. A coat of furniture varnish will do it good—cover up the many hard knocks it has received and put it in harmony with the woodwork, walls and floors. Or perhaps there are some pieces of furniture the finish of which does not conform to the owner's present ideas of good taste. It would be a shame to condemn it for so small a fault. A coat of varnish stain will give the desired finish and brighten it up too.

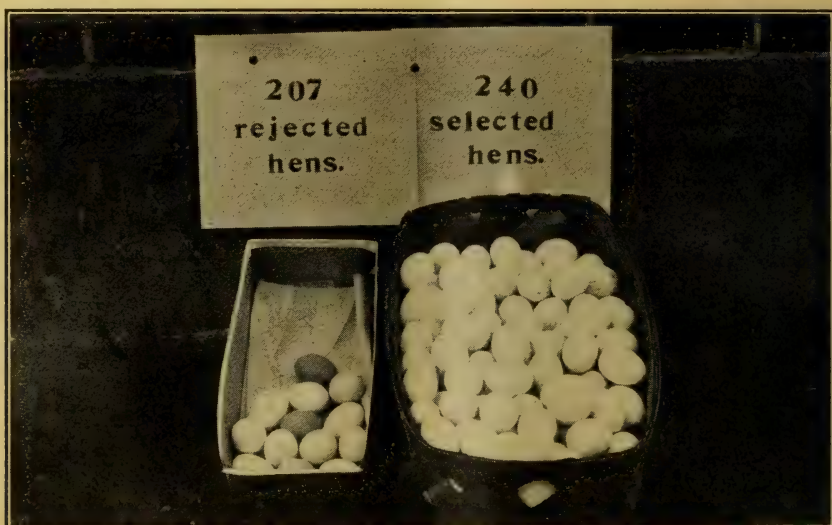
Tomatoes that will not mature in the garden before frost will continue to ripen if the vines are pulled and hung root end up in the cellar, before being damaged.

Improve the Flock by Culling

By P. I. Barker, '19.

IN all efforts to get good results in operations with Poultry the first essential is to get rid of all the material not suited to the purpose. We are particularly interested in the production and maintenance of healthy, good sized birds who are high producers. In order to obtain this class of birds we must weed out those poor producers and physical rejects which are bound to appear.

vigorous, plump and healthy while others may be found with only parts of their body clothed with feathers and the body poor, skinny and raw boned. If we were to compare this type of chicken to a corresponding type of hog in the hog lot it would be the runt which is afraid to fight for its place at the feed trough because it is undersized and unable to hold its own. If you were picking out from the hog lot a pen of hogs to make the best



Proof That Culling Pays.

The culling periods may well be divided into two classes, namely, (1) The culling of the pullets before they ever enter the laying house, (2) Culling of the yearlings or the laying flock.

Culling the Growing Pullets.

The farmer should become acquainted with his birds and during the growing season take particular notice of the pullets as they develop. A few very simple and easy means of culling of the inferior stock before they mature will greatly aid the poultryman, for it permits the selling of those less desirable birds at an early age which will cause a material saving in the feed bill. Besides at the age of from 8 to 12 weeks it is quite easy to pick out the culls. At this age the healthy, vigorous, early maturing chicks are well feathered out and are large,

gains in the feed lot, your selection would surely not include the runt. It is the same proposition with poultry. Likewise, the poor, unfeathered, underweight and stunted chickens will be only boarders in the laying pen if allowed to remain. Later in the season and just before they are placed in the laying house the final culling should be made. At this time emphasis should be laid on the constitution and vitality of the bird. Of course the laying type should be a determining factor but more especially the constitution for the bird is about to start a strenuous task of heavy egg production under heavy and forced feeding which needs the best physical body the hen can develop to enable her to stand up under the strain.

The points in general, giving the indi-

cations of a weak vitality are, first, the crow head. A head that is thin and long drawn out and flat like a crow's head shows frailness and a lack of vitality. Second, we must consider the size and general condition of the bird. One that is well developed with deep abdomen, well feathered, with plenty of life, and possessing the typical shape is the one most desired as a layer or breeder.

Culling Out the Poor Layers.

After the spring laying has somewhat slowed down it is well to keep one's eye on the hens with just a little suspicion, for along in July and August some of those hens are going to start moulting. They are the early moulters and least desirable and therefore as soon as they appear they should be separated and sold. The bird that has the pretty, smooth feathers next October and November is the one that most people keep because, as they say, "Isn't this a fine bird; just look how smooth her feathers are and how nice and yellow her legs are," but in reality she was that slacker that stopped laying about the last of July and didn't lay again. It is the shaggy looking one with blue white plumage, clear eye and white shanks that was laying all through the summer.

To determine when a bird is laying you examine the bird and if on examination you find the vent pale, moist, and dilated also the abdomen swollen, the skin taking on a white color and losing it's yellow, the pelvic arches wide apart and flexible, comb enlarged, warm and soft, she is in full laying. If her shanks are white it shows that she has been laying well for several months as the shanks are the last part of the body to lose color.

If these indications are absent it is a good indication that she is not laying and possibly has not been for some time.

With a little careful observance of the flock such things can be taken advantage of and the laying capacity of the flock much increased. The thoughts of selection should be on the mind of the poultryman now, for this is the time to begin preparing for that winter production in November, December and January when the price of eggs is soaring, and with

this selection it will ultimately be the maintaining and creating of a superior vitality, size and vigor in your flock.

INDIANA STATE DAIRY CONVENTION.

To be held at Seymour, Oct. 29-30-31.

Without doubt the Indiana State Dairy Convention to be held at Seymour, October 29-30-31, will be the greatest dairy event ever held in Southern Indiana. A three ring circus is a tame comparison to the program now outlined and prepared for the three days. A splendid program for the entire time from eminent speakers and authorities of the dairy world on the various dairy problems before us at present, together with a high class pure bred calf club distribution of Jersey calves, a butterfat contest in which twenty cows have already been entered, a big show of prize winning dairy cattle of all dairy breeds, a large combination sale of fine dairy stock, a practical cow testing association exhibit from the local association, the State Fair educational exhibit and the government exhibit from the National Dairy Show, etc., etc., are the basis for comparing the convention to a large circus. There's bound to be several things going on at once and you'll have to take your choice to see the most you can.

From present indications a very large crowd will attend and the committee are making adequate arrangements for the entertainment of the city's guests. Seymour is so situated that it is not only in the heart of a growing dairy interest but due to its railroad facilities is one of the easiest cities to reach in all Southern Indiana. The buildings available for the cattle show, for the auction sale, the machinery exhibits and for the conference programs are entirely satisfactory, hence the committee in charge feels that the convention to be held will be one of the greatest ever held.

The farmer or gardener who needs information, but neglects to make use of the publication of his state experiment station and those of the U. S. Dept. of Agriculture is overlooking a veritable mine of knowledge that may be had for just the asking.

The College Education

By J. R. Stubbs, '20

"Is it worth while to go to college?" is a question that is being asked by many people at the present time. Since the beginning of the war so many kinds of labor have been made highly remunerative and the day laborers are earning as much or more than some college professors, the question of the advisability of going to college presents itself. If we should consider money alone it might not pay every boy and girl to go to college, but the importance of being educated is felt right now and it will be even more noticeable in the future.

The man doing manual labor is receiving a good salary now, but he may be doing work not to his liking and he is not able to choose that kind of labor which he would take pleasure in doing, for he can only do one thing successfully. We all have a liking for some kinds of employment more than for others and it only is by fitting ourselves to perform certain kinds of labor that we are privileged to choose our occupation as suits our desires both as to pleasure and remuneration.

Then, too, the man who can have intelligent thoughts as he digs in the ground or can engage in intelligent conversation between his working hours will find a lot more enjoyment in life than will the man who must keep his mind constantly on the tools he is using and the work he is doing with his outfit.

It should be the aim of every boy and girl to have a college education, no matter what they may decide upon as a life time occupation. Talk with men and women of mature age, and if they have not had a college education, they will tell you it is the saddest mistake they ever made when they decided against going to college. Even a junk buyer, if educated could weigh up his articles and count his change with ease and enjoy more comfort in working. Then, too, his business would probably be more profitable.

A housekeeper may have more pleasure by performing her daily tasks with ease and comfort that otherwise would have

been drudgery, for she is educated in knowing how to do a thing properly.

There is nothing sadder in the life of a man or woman than to feel that every turn that they are handicapped by a lack of education. And there is nothing more satisfying to a laboring man than to feel that he can talk with understanding and intelligence to those whom he serves.

We should encourage boys and girls to plan for college early, since the time of education begins in youth. They should be prepared for any position in life that is opened to them and the college course may fit them for a change of duties and for the advancement in business or a profession.

English, History, and other studies that fit one for present day work should be a part of the college education of every student. And one of the much needed things now is a good business education. A knowledge of business matters and operations and the manipulating of a typewriter is very important to any boy or girl. More farm homes should have business offices, operated by a graduate student in business, for farming is a business proposition.

It is a great satisfaction to begin conversation with men who labor and find that they are posted on subjects in which you are interested—politics, the topics of the day, and other things that make up a conversation. The manner of address is a good standard for rating men intelligently.

By all means, every boy and girl should seize the opportunity to go to college. If an opportunity is not forthcoming your way, you can find or make one. Money spent on education will pay big interest for the amount invested and it is a business that is sure to pay yearly dividends. Try it and see; you will never regret it.

No man drops into a better world by dodging this one.

Getting business is like courting a girl. You must offer the right kind of goods and keep on calling.



Tom Christensen, who had nerve enough to install the first Perfection in his community.

His Neighbors Laughed at Tom Christensen When He Bought His Milker. Now There Are 50 in His Neighborhood.

THREE years ago no one in Tom Christensen's neighborhood had ever used a milking machine. Mr. Christensen wanted to make more money out of his farm. But he did not have hands enough and there weren't enough hours in the day.

It took nerve to resist the scoffs of his neighbors and to try something new.

"When I first put in my milker," says Mr. Christensen, "everyone around here said, 'There's another boob who's going broke on machinery. He will ruin his cows and he will lose a lot of money.'"

"But my hired men were going to leave and I had to do something. Today the Perfection Milker has changed this farm. We have an electric light plant, an electric washing machine, an electric vacuum cleaner and other improvements, but I was saying to my wife the other day that while all these things help us a great deal, it was the Perfection Milker that started us.

The Cows Lick the Perfection.

"Instead of my cows being hurt by the milker, they like it. When I start the milker, I have often heard my cows bellow for it just like for their own calves and then turn around and lick the pail. You never heard of a cow licking the hand of a man who was doing the milking, did you?

"And the Perfection is better for my cows than hand milking. When a hired man thinks it's quitting time, he hurries and doesn't milk clean. This cuts down the amount of milk for weeks and makes no end of trouble. But my Perfection milks each cow just the same every night and it never gets mad no matter what happens.

"My wife and I both had to milk before we had the Perfection. Now my two little boys often do the milking alone and it only takes them 40 minutes.

And The Neighbors Own Perfections, Too.

"When my neighbors found out that my milk check was averaging over \$500 a month, they began to have a new idea about the Perfection Milker. Today there are 50 Perfections within a few miles of my place and everybody is satisfied with them."

Mr. Christensen's story is the experience of one of thousands of practical dairymen.

Send For Names, Addresses and Catalog.

We will gladly send you his address together with the names and addresses of many other Perfection owners to whom you can write. We will also send FREE, "What the Dairyman Wants to Know,"—the book that answers every question about milking machines. Write today.

Perfection Manufacturing Company

2146 E. HENNEPIN AVENUE

MINNEAPOLIS, MINNESOTA

The Perfection is The Milker with the DOWNWARD Squeeze Like the Calf

PERFECTION MILKER

Fall Plowing

By Harry Engle, '20.

THE practice of fall plowing land suitable for fall plowing, has many advantages, and one of the first to be mentioned is the economy of labor. This is mainly brought about because it can be done in the late fall when the farmer is not rushed with either the planting or harvesting of his crops, and in many cases the employment of extra labor is avoided. Also, where much plowing is done in the spring, the last land to be plowed is usually very dry and breaks up in large clods that require a great amount of extra work to pulverize and in many cases the farmer finds it necessary to plant the corn when the soil is in no condition for planting, with the result that the corn is poorly covered or remains in the ground several days waiting for a rain. By plowing even a part of the land in the fall the remainder may be plowed in the spring before the ground is very dry.

Fall plowing increases the moisture content of the soil under certain seasonal conditions by retaining snows and rains long enough to permit a large percent of the water to soak into the soil, and when near a wood many leaves may be retained and thereby increase the fertility and organic matter content of the soil. In addition to increasing the moisture content in winter, fall plowing aids greatly in conserving soil moisture in the spring. Plowed land may be easily and quickly mulched with a harrow as soon as dry in the spring, where if left unplowed or in a compact condition much moisture is lost both by evaporation and by transpiration through any weeds or other plants that may be growing on the ground. When one stops to think that a plant gives off its own weight of water every twenty-four hours he can realize that loss of water through this avenue alone may soon be enormous.

The soil never becomes too dry to be plowed in the fall when looked at from the standpoint of benefit to the soil, but it may become so dry that it is impossible from a power standpoint to do the work with horses. In this case the tractor

works in to good advantage, since it can produce the power and there is no possible chance of doing damage to the soil. Fall plowed land even if plowed slightly wet will yield a better seed bed in the spring because the freezing and thawing, and wetting and drying of winter and spring will produce a porous, granular effect and thereby undo any damage done by plowing slightly wet if the land is suitable for fall plowing.

It may be well at this point to consider which soils should be fall plowed and which should not. Soils of coarse and medium texture as sandy loams, loams, silt loams, and even clay loams, if well supplied with organic matter, may well be fall plowed. As a rule only fine heavy soils deficient in organic matter and inclined to run together or soils on steep slopes subject to washing, should not be plowed in the fall.

Fall plowing reduces surface erosion on lands with gentle slopes by temporarily holding water on the surface, due to the many small pockets and valleys between the furrow slices and thus prevent the washing process from starting. In this case it is best to plow around the hills or horizontal with the slope and provide miniature terraces.

Coarse weeds, stalks, stubbles or other organic matter in large amounts are better handled in the fall than in late spring because this gives the soil a chance to settle firmly around the rubbish and provides moisture for early, prompt, and rapid decay, a thing that is not possible in late spring plowed land. Moreover by this firming of the soil about the organic matter a good capillary connection is again restored between the furrow slice and the subsoil and prevents the surface from drying out.

A great benefit to be derived from fall plowing is in the control of insects. Late fall plowing destroys many eggs and many insects after they have established themselves for the winter.

Whether the land is to be plowed in the fall or spring it is well to bear in

(Continued on page 50)

MAINTENANCE PLUS MILK PRODUCTION

The maintenance of your dairy cows represents a fixed expense—you can't get away from it because nature has wisely constituted the dairy cow so that her bodily maintenance gets first call from the feed she consumes. Feeding just enough to keep cows alive is poor economy—it means low milk production and weakened constitutions. You must feed enough to cover both bodily maintenance and maximum milk production before your cows can pay you a profit. You will find it pays big to feed

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

generously at all seasons of the year, but especially so right now because your cows have just passed through the hot, short pasture season—their reserve energy has been heavily drawn upon—their vitality and stamina are at a low ebb and can only be restored by generous feeding of the proper grain ration if they are to produce profitable results this winter. Feeding SCHUMACHER FEED and BIG "Q"—NOW—will put your cows in tip top condition so that you will get the benefit of the present good milk prices during the fall and winter. You'll save feed later on by feeding all your cows will consume NOW.

No other feeds in the world so well supply the maintenance and milk production requirements of the dairy cow as SCHUMACHER FEED and BIG "Q" DAIRY RATION. This is proven by the fact that they have helped 35 World's Champion Dairy Cows to make their world's records, and by the further fact that the foremost dairy-men in the country feed and endorse SCHUMACHER FEED and BIG "Q" DAIRY RATION enthusiastically.

These well known, widely used and dependable feeds are not an expense—they are big profit makers. Your dealer can supply you.

WARNING! Don't burn out your cows from feeding too much protein. Excessive protein in ration greatly increases cost and does not give the maximum milk production throughout lactation period.

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The Quaker Oats Company

ADDRESS, CHICAGO, U.S.A.



Alumni and Local

I. L. Baldwin, '19, is teaching soil bacteriology at Purdue.

M. P. Shierling, '19, is doing vocational work at Eaton, Indiana.

L. L. Stewart is instructor in Poultry Husbandry at Iowa State College.

B. G. Sollman, '15, is taking up farming at Fort Branch, Indiana.

F. T. Evans, '16, is in the circulation department of The Cleveland Plain Dealer.

S. P. Smyth, '13, is assistant professor in the Poultry Department at the University of Idaho.

M. B. Kroft, '17, is with the Extension Specialist and Farm Management at Kentucky Agricultural College.

E. H. Leindecker, '19, is assistant superintendent in the Purdue creamery doing instructional work.

C. O. Tuttle, '13, efficiency man for Schlosser Brothers Creamery, of Frankfort, Indiana, was back visiting about the University recently.

G. L. Ogle, '14, A. E. F., was discharged in July and was married in August to Miss Mariam Beall, and is now located in Evansville.

J. R. Zartman, '17, 1st lieutenant, A. E. F., was discharged in August and has returned to the farm with his father at Camden, Indiana.

Millard Crane, '11, captain quartermaster's department, A. E. F., was discharged August 1st and is now doing vocational work at North Judson, Indiana.

H. H. Steup, A. L. Becker, and C. H. Werkman are doing poultry and egg transportation work with the U. S. Food Research laboratory and are located at 21 Jackson Place, Indianapolis.

ABOUT THE UNIVERSITY

The New Horse Barn

The new horse barn has been completed and is now ready for use. The building is very attractive as well as a very well arranged one. The new building is built of two wings with a large arena in the center where student judging classes will be held. One of the wings will be used for housing the work horses of the farm and the other will house the breeding stock with which the farm is to be stocked.

Every detail for convenience including concrete watering troughs, feed rooms and harness rooms are included in the construction of the new barn which has been a point of much interest and admiration to persons visiting the University community.

The new barn is the start of the Agricultural Department campaign to stock the farm with pure bred horses. That the University authorities are confident that the horse will not be eliminated from the farm by tractor is evidenced by their building such a model construction.

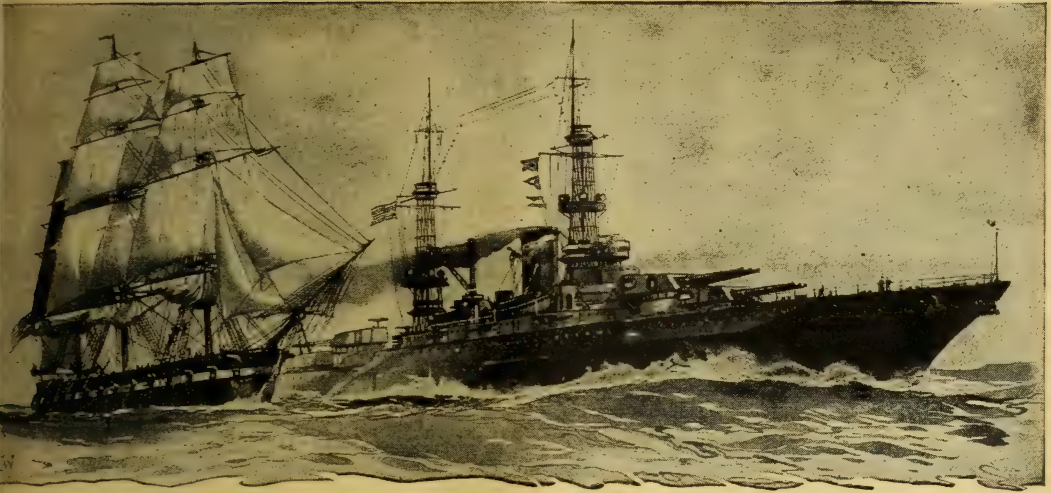
Six new poultry houses have been built at the poultry farm at a cost of about fifteen hundred dollars.

A new beef cattle barn is now being constructed on the farm just west of the orchard. A large concrete silo is being erected in connection with the barn. The present observations indicate that it will be as near an ideal as the horse barn.

FOOTBALL.

WITH the coming of the first normal fall since the ending of the great war, football prospects at Purdue look exceedingly bright. Many of the old men have returned to the University to take up their studies where they left them to go into the service, and with them backing the large number of younger, less experienced men, should form a strong, powerful team.

"Butch" Scanlon is again coaching the
(Continued on page 42)



The "Constitution" of To-day—Electrically Propelled

THE U. S. S. "New Mexico," the first battleship of any nation to be electrically propelled, is one of the most important achievements of the scientific age. She not only develops the maximum power and, with electrical control, has greater flexibility of maneuver, which is a distinct naval advantage, but also gives greater economy. At 10 knots, her normal cruising speed, she will steam on less fuel than the best turbine-driven ship that preceded her.

The electric generating plant, totaling 28,000 horsepower, and the propulsion equipment of the great super-dreadnaught were built by the General Electric Company. Their operation has demonstrated the superiority of electric propulsion over old-time methods and a wider application of this principle in the merchant marine is fast making progress.

Figures that tell the Story of Achievement

Length—624 feet
Width—97 feet
Displacement—32,000 tons
Fuel capacity—a million gallons (fuel oil)
Power—28,000 electrical horsepower
Speed—21 knots

Six auxiliary General Electric Turbine-Generators of 400 horsepower each, supply power for nearly 500 motors, driving pumps, fans, shop machinery, and kitchen and laundry appliances, etc.

Utilizing electricity to propel ships at sea marks the advancement of another phase of the electrical industry in which the General Electric Company is the pioneer. Of equal importance has been its part in perfecting electric transportation on land, transforming the potential energy of waterfalls for use in electric motors, develop-

ing the possibilities of electric lighting and many other similar achievements.

As a result, so general are the applications of electricity to the needs of mankind that scarcely a home or individual today need be without the benefits of General Electric products and service.

An illustrated booklet describing the "New Mexico," entitled, "The Electric Ship," will be sent upon request. Address General Electric Company, Desk 44, Schenectady, New York.

General Electric Company

General Office
Schenectady, N.Y. Sales Offices in
all large cities

ATTEND THE NATIONAL DAIRY SHOW

The Thirteenth National Dairy Show will be held in Chicago on October 6-12 inclusive. It well behooves every farmer in Indiana, whether a dairyman or not, to attend this show, since it is one of the biggest educational exhibits staged in the country. Its location at Chicago makes it convenient for every Indiana farmer to attend.

The best blooded and most aristocratic dairy stock of the United States will be housed here for seven full days in order that every farmer and breeder may have a chance to become acquainted with real breed types and high producing individuals. All of the officials of dairy organizations will be there to give expert advice, and meetings of the different breed associations will be held during this time. Models of up-to-date farm structures and labor saving devices will be on display and expert engineers will be there to talk over farm construction problems. Hundreds of thousands of dollars worth of manufacturing equipment will also be

on exhibition, and demonstrations will be given in the operation of the various makes of machines.

The evenings will be made entertaining with a high-class horse show at which ribbons will be awarded to the best drivers and riders and the classiest horses in the ring. Entries range from the smallest Shetland ponies to the heaviest of draft horses and includes some of the fanciest saddle and driving horses in the country.

A little variety is introduced in the form of an auto show of the highest kind. If you are planning on buying a machine this will help you make a selection.

The show will make a fine vacation trip for yourself and family and besides be an inspiration and an education of one of the greatest industries in the United States.

EVANSVILLE CENTENNIAL EXPOSITION.

Ten days of enjoyment and education for the people of Southern Indiana will begin on October 14, 1919 when the gates of the Evansville Centennial Exposition, commemorating the one hundred years of growth of Evansville, will be thrown open.

Three prominent ideas are foremost in the plans now being made. These are Patriotism, Production and Progressiveness. All efforts are being focused upon making the exhibits more clearly reflect the resources and possibilities of those sections of Indiana, Kentucky and Illinois, adjacent to Evansville, and to make the exposition broader and more educational in its scope.

A splendid premium list is offered on all livestock and agricultural products and many prominent exhibitors have signified their intentions of making an exhibit. Negotiations are being made to secure the U. S. Department of Agricultural exhibit from the National Dairy Show which will be held at Chicago just prior to the Centennial, and several other exhibits from the various state fairs have been promised. These will make an unusual educational exhibit and an attraction that will draw the people. Don't fail to be there.

University Pharmac Y

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Candy, Cameras and Supplies.

Exclusive agents in West LaFayette for Nyal Quality Drugs.

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Manufacturers of the following
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FLOUR

"LAFAYETTE MILLING CO.'S
BEST"

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ARAWANA FARM'S SEVENTEENTH SALE OF POLAND CHINA SWINE

to be held on the farm, two and one-half miles
east of Lebanon, Indiana, on the

NIGHT OF OCTOBER 22

We will sell

60 HEAD of tried Sows, fall Gilts,
spring Boars and Gilts

For size and individuality this offering will not be surpassed during this sale season. Every animal is a real herd prospect. We sell more Big Types than any firm in Indiana. We sold 340 pure bred hogs for breeding purposes in 1918 and sold every one of them guaranteed to satisfy. This lot of hogs carry the blood of Mammoth Giant, Arawana Standard, Long Fred and The Clansman's Equal. We can show March pigs that have just grown 1.45 pounds every day of their lives and are now in good breeding condition. Many Purdue graduates are among our best customers. I was a freshman at Purdue when we bought our first pure bred hog. Students of the School of Agriculture, lay your plans while in college and when you are graduated you can have a job and a business waiting for you.

We shall be glad to see that you have our catalog, if we have your name and address.

We sell hogs privately and if you need a sow or a boar we are prepared to accommodate you at any time. Prices right and every purchase guaranteed to please.

JOHN N. SICKS.

CLAYTON SICKS.

PURDUE'S TEAMS.

(Continued from page 38)

'Varsity squad. He is well remembered as the man who developed the first Purdue football team to defeat Chicago in twenty-two years. He was a star tackle in his college days, having played with Stagg's Maroon team. He coached the Hyde Park high school team for several years and he was so successful that he was brought here to coach the Boiler-maker team.

Of the sixty men now on the squad,

"LaFayette"**HOMINY FEED**

Corn Meal
Hominy
Grits
Corn Flour, Etc.

**LAFAYETTE CORN FLOUR
MILLS**

LAFAYETTE, IND.

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**STUDENTS' ACCOUNTS
SOLICITED**

The Varsity

Rapid Shoe Repair Shop
guarantees finest workman-
ship and perfect satisfaction

Jacob Bossung

302 State Street. West LaFayette

only four are wearers of the football letter. They are Huffine, Cooley, Smith and Church. All four of these men were in the service last year and did not play on the Purdue team. Members of last year's team who are back are Birk, Meeker, Stanwood, Daley, Quast, Mitchell, Rate and Wagner. These men received miniature gold footballs with the score of the Chicago game engraved on them in recognition of their services on the team.

A fast backfield has been developed and tried in recent scrimmage. Church and Daley, halfback; Huffine, fullback, and Wagner and Macklin at quarters. The kicking and passing end of the game is very well taken care of. Huffine, Quast, Wagner and Smith have been punting around fifty yards consistently and Huffine's passing ability is too well known for comment. In fact, his all around ability is held at such value that his loss to the team now would be a serious blow to Purdue's chances for a winning team.

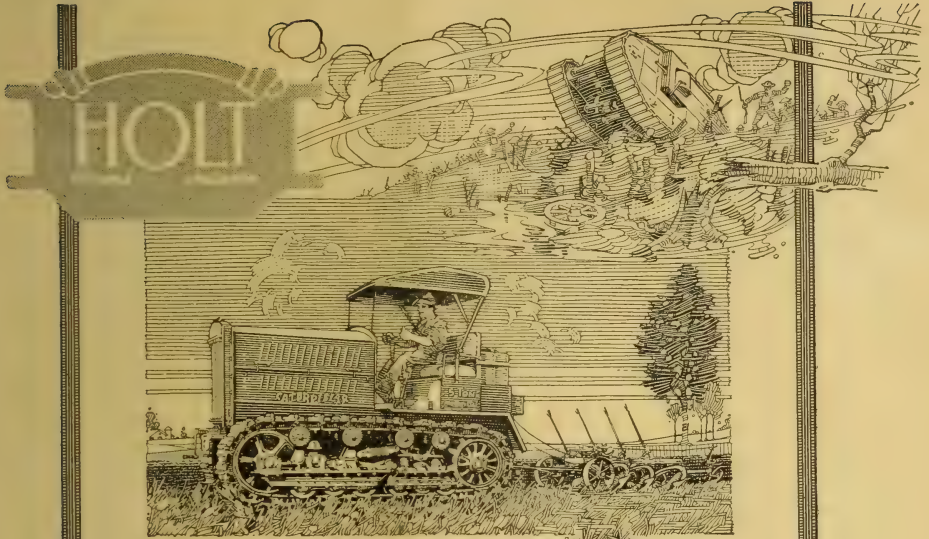
Scanlon arrived September 14 and hard daily practice was started at once. This hard work will be continued until the first game of the season with Franklin on October 4. Purdue's schedule shows that she will play three of the strongest teams in the conference this year and the squad will need the strongest backing of the students and alumni to put the victories across.

CONSERVATION OF FARM MANURE.

(Continued from page 7)

To regulate decomposition or fermentation of manure, means the preventing of the escape of nitrogen either in the free state or in the form of ammonia. The greatest fermentation takes place when the manure is dry and loose. The bacteria which cause decay must have plenty of air. When the manure is moist and compact the air is shut out to a large extent and little nitrogen is lost. Moisture also keeps down the temperature by its cooling effect.

In conclusion we may say that the most efficient method of handling manure, and conserving its plant food value, is to have a water-tight stable floor, use plenty of bedding, keep the manure moist and compact, use some chemical absorbent as



yesterday
today
tomorrow
PERFORMANCE

The "Caterpillar" has always been a *continuous performer*—dependable for *any work at any time*.

Yesterday it did things that *made world war history*.

Today's "Caterpillar" is an exact duplicate of those sturdy engines that moved guns, food, ammunition and supplies ever forward—the final tractor achievement of Holt and Allied army engineers.

CATERPILLAR

The record of the "Caterpillar" is your positive proof that it will do your work—belt and draw bar—when, and as you want it done. Plow as deep as you like—faster than you ever plowed before; disc, harrow and seed your land—all with a "Caterpillar". Each job will be done right and on time.

The five ton "Caterpillar" is different from any tractor ever built. It develops upwards of 3,100 pounds draw bar pull. Plowing speed *three miles per hour*. Pulls easily four 14 inch plows, 8 to 10 inches deep. Catches and lays its own track.

If you should strike a rut or sand it can't stop the "Caterpillar". Turns in its own length, making close fence corner work simple. Equipped with three speeds and reverse. Travels on the road over five miles per hour.

You will be interested in receiving free literature describing each feature of "Caterpillar" supremacy. Write

the **HOLT Manufacturing Co., Inc.**
There is but one "**CATERPILLAR**"—HOLT builds it.

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Feeding of Texas Bred Hereford Baby
Beeves a Specialty.

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look in our win-
dows and you
will see the new
Autumn Styles
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are the leaders
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ions. This is the

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112-14 W. Side Sq.
B. & J. HIRSH,
Props.

stated above, and most important get the manure on the fields as soon as possible.

FALL MANAGEMENT OF THE LAYING FLOCK

(Continued from page 10)

solution into the water to color it a cherry red. Metal drinking fountains should not be used with permanganate, as the chemical reaction destroys its value as a germicide.

When the pullets are placed in the laying house or a little before, a gradual change should be made from the growing ration to a more concentrated laying ration. The following Purdue laying ration will be found very satisfactory for this purpose.

Grain	Mash
10 pounds corn	5 pounds bran
10 pounds wheat	5 pounds shorts
5 pounds oats	3½ pounds meat scrap

Grit, shell, ground bone and green feed should be available at all times, and milk can be used to supplement any shortage in meat scrap. About fifty pounds of skim milk or buttermilk is considered equivalent to three and one-half pounds of meat scrap.

The grain should be fed in a straw litter twice daily, feeding more at night than in the morning. The dry mash should be kept in an open hopper at all times. The feeding should be arranged so that the birds will eat one-half as much mash as grain.

If the heavier breeds, such as Plymouth Rocks, are kept, they should be watched carefully to see that they do not get too fat. If they do, cut down the mash by closing the hopper during the forenoon. Every poultryman and farmer should re-

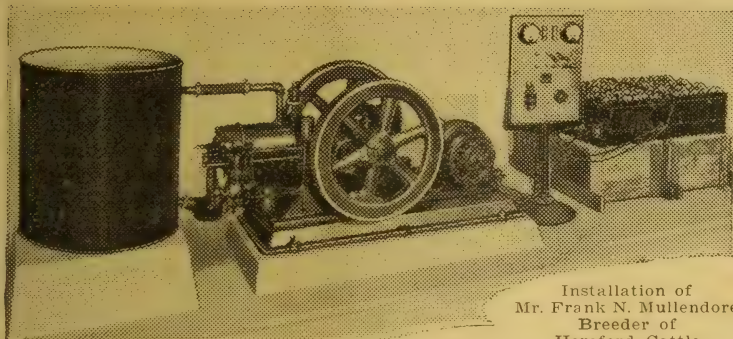


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Roofing Products

Metal makes the most satisfactory roofing for farm buildings or city construction.

APOLLO-KEYSTONE Copper Steel Galvanized Sheets are unequalled for Culverts, Tanks, Silos, Roofing, Spouting and all exposed sheet metal work. Look for the Keystone added to brand. Sold by leading dealers. KEYSTONE COPPER STEEL is also superior for Roofing Tin Plates. Send for "Better Buildings" booklet. AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.



Installation of
Mr. Frank N. Mullendore
Breeder of
Hereford Cattle
Franklin, Indiana

Investigate the Service that a **SWARTZ LIGHT PLANT** will give you

And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

A Word as to the Swartz Policy

From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

Send for Complete Information

There is a Swartz Electric Power and Light System of proper size and voltage to meet your individual requirements at minimum cost. Ask for your copy of the Swartz Catalogue.

Swartz Electric Company

Oldest Exclusive Makers.

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HAYWOOD PUBLISHING COMPANY

LaFayette, Indiana



If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

member that if they have early hatched pullets and manage and feed them properly they will get a good return of fall and winter eggs and make a good profit.

AGRICULTURAL CONDITIONS IN THE PRAIRIE PROVINCES OF CANADA.

(Continued from page 16)

tions have been able to produce varieties of wheat, oats and barley that will yield fairly well, with from ten to fifteen inches of rainfall during the season. This water-fall is a result of the melting snow and comes mostly during the spring season.

The Canadian government is giving considerable help and encouragement to farmers, by furnishing seed grain and plowing the tough sod the first time with tractors. With the government and farmers taking interest in the agricultural conditions it seems probable that in a short time Canada will become one of our largest producing countries.

SELECT YOUR SEED CORN NOW.

(Continued from page 19)

greatly reduces the yield of the crop grown from such infected seed.

The storage place for the seed corn should be dry and well ventilated. Artificial heat, if used should be coupled with extra good ventilation, but artificial heat need not be used except in very late years. The ears should be hung by the shucks or placed in racks so that no two ears may touch. After the corn has dried out thoroughly, it needs only to be protected from the weather, for freezes will not hurt it.

C. W. Carrick also made trips through the South and East visiting Experiment Stations in commercial poultry plants, and spending several days in the Vine-land Poultry District in New Jersey.

B. C. Kennard, instructor in Poultry Husbandry at the University, made a trip through the West during the summer visiting the poultry departments of experiment stations at Madison, Wisconsin, Portland, Washington, Corvallis, Oregon, Davis, California, and several commercial plants in the Petaluna District, California.

Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

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There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

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 SPECIALTY.**

THE 1919 APPLE SHOW.

(Continued from page 23)

under conditions that encourage superiority. Too much emphasis can hardly be placed upon the necessity for increasing the apple acreage of the state, and the apple show is one means of doing it.

A premium list of the show may be obtained by writing to the Secretary, Indiana Horticulture Society, Agricultural Experiment Station, LaFayette, Ind.

VOCATIONAL AGRICULTURE IN INDIANA

(Continued from page 26)

Hughes Schools. The federal funds for vocational work are used to supplement our state vocational funds. All approved vocational work in Indiana meets in full the requirements of the Smith-Hughes Act and the regulations of the Federal Board for Vocational Education. The state and federal vocational education acts and the state and federal vocational funds are for all practical purposes administered as one law and one fund by the Indiana State Board of Education.

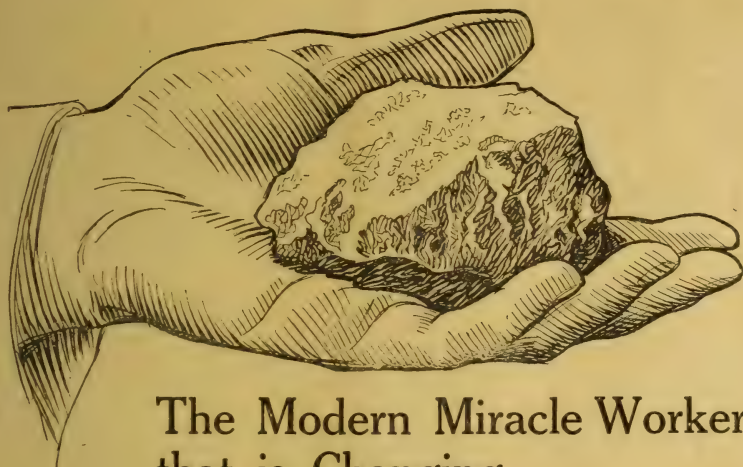
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Carbide Gas lights the entrances to the Panama Canal, Government Barracks, light-houses, buoys and school houses. It supplied light to the contractors who built the New York Subways, and the great Catskill aqueduct tunnel under the Hudson River at Storm King.

It already lights quarter of a million farm houses and barns, hospitals, fields for night ploughing, and is used for loading and unloading of all kinds. Over 700,000 miners depend on Carbide Gas to work by.

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Store for Men

Absolutely no better or
safer place to buy

SHIRTS, NECKWARE,
HOSIERY, GLOVES,
UNDERWEAR.

FALL PLOWING

(Continued from page 36)

mind the things that constitute good plowing. Good plowing saves labor in the preparation of the seed bed. It gives all plants of the crop an equal chance and all a much greater advantage than on poor plowing. For good plowing the following things are necessary:—

1. The entire furrow slice should be cut loose and turned about three-fourths over, but not laid flat. In simple words, "cutting and covering" is not good plowing.

2. The plowing should be done to a sufficient depth to produce pulverization. In most cases the soil is not pulverized to any extent when plowed only three or four inches deep. For best pulverization plowing should be five to seven inches deep.

3. The turning under of rubbish is essential to good plowing. To do this properly the furrow slice should be five or six inches thick and in some cases chains or weed hooks are necessary.

4. The furrow should be kept straight

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Manufactured in accordance with the Indiana Feeding Stuffs Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining "KINGAN'S" Digester Tankage of your dealer.

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**BEEF AND PORK PACKERS,
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Why Cane Mola is Fed by Scientific Farmers

Because this 100% pure sugar cane molasses, imported direct from the West Indies, is the cheapest food you can buy today, Prof. Savage, of Cornell, has recently compiled a table published in the Dairyman's League News showing that cane molasses containing not less than 53% sugar supplies more digestible nutrient per dollar expended than any known feed. An analysis of

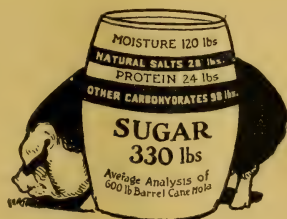
CANE MOLA

proves that it meets this test. It practically equals corn in food values; costs just about half as much. The Department of Agriculture has compiled two bulletins on cane molasses as a feed. One proves that it makes a hay and grain ration 14% more digestible, the other that its energy value is tremendously greater than that of any other feed. See Bulletins 117 and 125.

Cows give from 10% to 20% more milk on Cane Mola; hogs gain weight quickly; horses and mules show more pep. Analysis on every barrel. Write Dept. H for literature; it's free.

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Dairy Preparations

For cheese and butter making on the farm as well as in largest creameries and cheese factories, Hansen's preparations are standard. They are pure, concentrated, and simple to use.

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Hansen's Danish Butter Color, and Hansen's Cheese Color are used in the finest creameries and cheese factories. Hansen's products are on sale at drug or dairy supply stores or sent direct.

"The Story of Cheese Making" by J. B. Frederiksen, free on request.

Chr. Hansen's Laboratory, Inc.

Little Falls, N. Y.

or at least parallel with the middle ridge as a crooked furrow is a good indication of "cutting and covering" at some points.

The man who never made a mistake never made anything.

C. W. Carrick, of the Poultry Extension Department, and A. G. Phillips attended the Poultry Instructor's meeting at the Ontario Agricultural College, Guelph, Ontario, Canada.

The University started off this year in fine shape, with an enrollment of over two thousand five hundred seventy-five students, over twelve hundred of these being Freshmen. Everybody seemed anxious to get back to College after two years of turmoil. Dean Skinner and Professor Fisher were kept busy on the "Ag" side of the road for about two weeks trying to straighten out the many tangled schedules and irregular students who have been out for one or more years on account of the war.

Over Forty One Million Dollars!

An enormous sum

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large as it is—

We sold Forty One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

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Moline Service means exactly what it says—and we have perfected an organization which enables us to furnish Moline Service that satisfies. We can do this because:

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3. Every Moline Tractor Dealer is required to carry Moline-Universal Tractor repairs in stock and have a competent service department to provide prompt and efficient service.

4. Tractor schools of short duration in charge of expert instructors are being held in co-operation with Moline Tractor Dealers, to instruct farmers in the care and operation of Moline-Universal Tractors. These schools will continue to be held as long as there is a demand for them.

5. With every Moline-Universal Tractor we furnish a complete instruction book, giving full information on care and operation of the tractor.

6. Moline-Universal Tractors are simple in construction, have the best materials and workmanship money can buy, and all working parts are quickly accessible.

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If any Moline-Universal Tractor is not giving its owner satisfactory service we want to know about it *immediately*.

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John Deere Implements have been in the hands of users for more than eighty years. The verdict of these users has established a world-wide John Deere reputation for good work and long wear.

To maintain and increase that reputation is the constant aim in the manufacture of John Deere Implements today.

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The PURDUE AGRICULTURIST

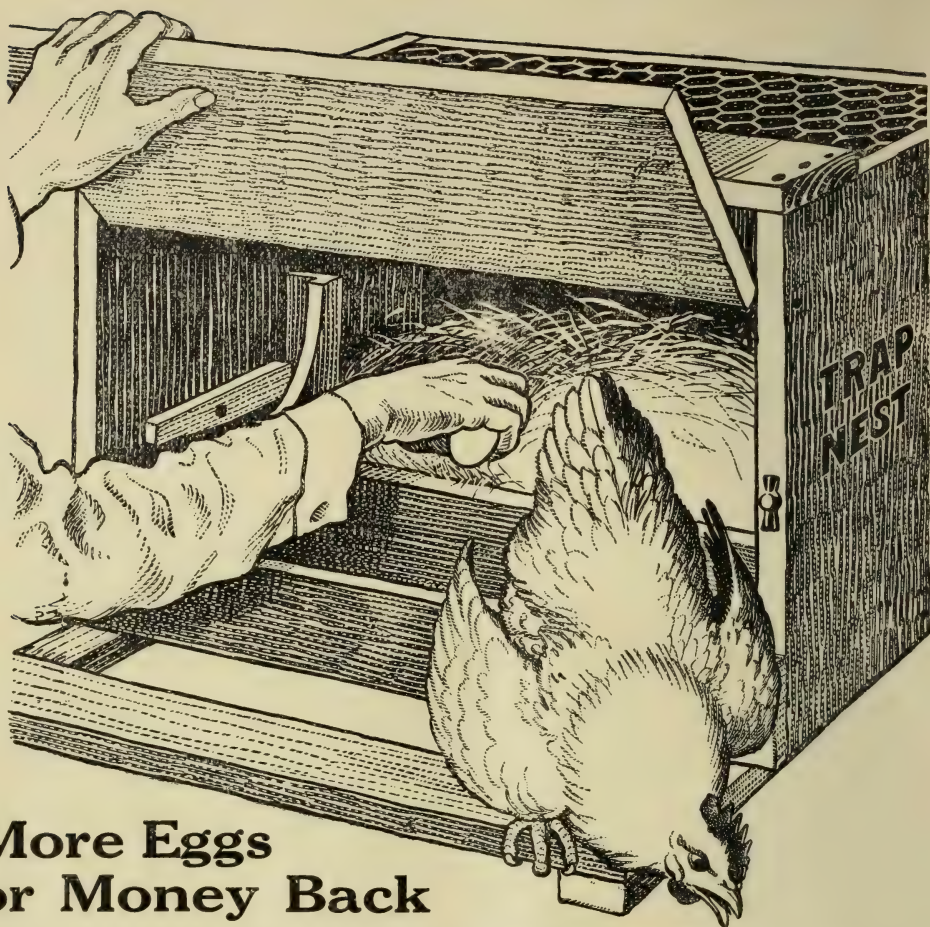


NOVEMBER, 1919



Vol. 14

No. 2



More Eggs or Money Back

The money paid for Purina Chicken Chowder will be refunded if hens, when fed Purina Chicken Chowder with Purina Scratch Feed as directed, do not lay more eggs than when fed any other ration.

This unusual guarantee is based upon the demonstrated egg-producing qualities of this correctly balanced ration. The reason why this broad guarantee is possible is that

Purina Chicken Chowder and Purina Scratch Feed

when fed as directed, supply a perfect balance of yolk and white elements above the requirements for body maintenance. Based on the statements of one of the most prominent State Experiment Stations, it is shown that:

	Yolks Whites	
50 lbs. of Purina Scratch Feed are capable of producing.....	123.75	71.06
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A 100-lb. ration (50 lbs. of each) is capable of producing.....	214.77	212.33

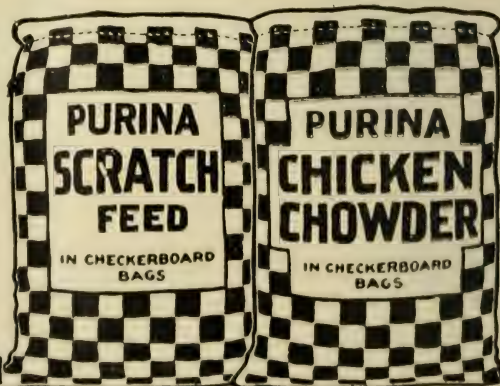
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**TREAT YOUR PIGS NOW—
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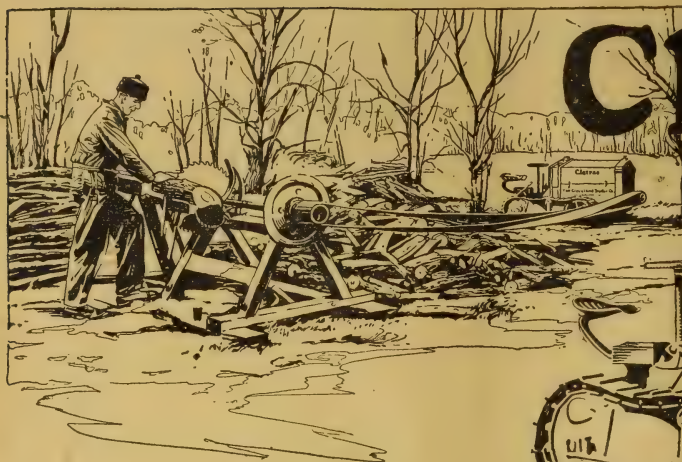
The Single Bled from the Swine Breeders Pure Serum Company saves your hogs. Experience has proven it to be **the best**. We can supply your wants at once.

Prompt attention given to all orders.

Don't wait until you get disease in your herd. Save trouble and loss by treating your pigs now while they are well. Write.

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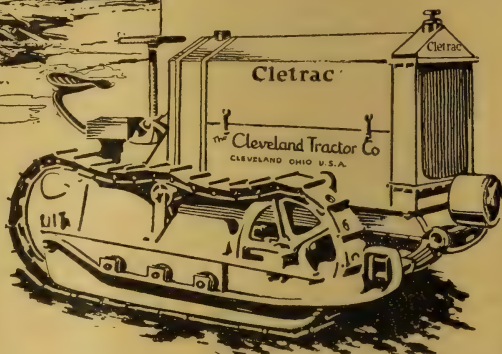
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THERE is no "off season" for the Cletrac. It is a year-'round investment paying the farmer a steady interest from January to December.

When there is nothing for the Cletrac to do in the fields it can be kept profitably busy on hauling jobs or belt work. It knows no equal at dragging dead weight and is a master at farm belt work.

The Cletrac runs on metal tracks like a locomotive. No extra power is required to push it **through** the soil—it goes **over the top** of the ground and puts all of its power into pull, where it belongs.

And lining up for a belt job is a matter of a very few minutes. The Cletrac is rated at 20 belt horse power but under test has developed better than 24.

The Cletrac operates on a very small amount of kerosene, distillate or gasoline. It does more work, more days in the year, and does it better, cheaper and quicker than horses or mules or other types of tractors.

Our book on practical power farming will be a big help to any agricultural student. Ask for "Selecting Your Tractor." It's free.

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NOVEMBER, 1919

NUMBER 2

Conservatism in Cattle Feeding

By F. G. King,

Associate in Animal Husbandry

IS the cattle business on the decline? Many reports indicate that this condition exists. One county agent writes that of 75 silos in his community very few are being filled. He attributes this to the belief that the feeding value of silage is not appreciated. This is not the case however. The real reason is that large numbers of cattle feeders are not putting cattle into their feed lots this winter. It is not one particular phase of the feeding operation of which they are in doubt but the entire cattle feeding business. Many banks report that the notes given for money to purchase cattle are less than for a great many years and that cattle feeders in their community are not filling their feed lots. Large numbers of the communities are making this same report that silos are not being filled, that cattle are not being purchased for winter feeding operations and that the cattle feeding business is on the decline in their community.

Such conditions must have some underlying cause. Such things do not happen by chance. Among the causes may be mentioned the fact that prices have been extremely high—based on conditions existing either during the war or immediately following it. There is an opinion quite prevalent among feeders that everything is so high that there must sooner or later be a readjustment period and that farm products will be among the first to feel the effects of such readjustment. This is especially true with cattle because under the system of fattening cattle as practiced in Indiana, practically two-thirds as much weight is purchased as feeding steers as is sold as fat animals. Therefore, the operation is not one of fattening alone but also a business risk in that the stockman is taking a chance

in the market on all the cattle that he purchases to go into his feed lot. A thousand pound steer will be purchased and fed for a period of from five to six months and sold at a weight of approximately 1,400 pounds. Considering that by far the greater amount of the selling weight of the steer is purchased as a feeder steer it is readily apparent why the farmers are hesitating to put feeding cattle into their lots when many indications are that the prices of farm products will seek a lower level. Conservatism, therefore, demands that a minimum amount of stock be carried in the hands of feeders during the period of readjustment or that feeder cattle be secured at a lower price than has been prevalent this fall.

Farm products, especially roughage on which cattle quite largely depend, are very high in price and offer a cash product that can be converted into ready money. Feeding cattle are very high and farmers are hesitating about transferring a readily saleable product into a more or less speculative channel such as is offered by cattle feeding. Added to the high cost of cattle and feed and the general opinion that there must be a natural readjustment of prices is the additional element of uncertainty due to a feeling of unrest among the industrial population and agitation as to the cost of living which is directed not so much at farmers as against their distributing agencies. This finds a direct reflex on the farmers and their products. As a matter of fact the farmer receives a very small percentage of the money actually expended in the cost of living. But since he is dealing in the raw products that have to do with the living conditions of the country his products are the first that feel the effect of such agitation.

With such conditions as these prevailing it is not surprising that there should be more or less of a feeling of uncertainty on the part of the cattle feeder and that many should prefer to pursue a conservative policy until business conditions have become more settled and agitation shall have run its futile course so that conditions are more nearly normal.

Under normal conditions it is possible for a farmer to formulate some idea as to the prospect of profits in the cattle business because he can within certain limitations be assured that there will be no abnormally violent fluctuations in the livestock market, that such variations as occur will be gradual changes brought about by the supply and demand for meat products, and an absence of abnormally violent fluctuations that we have at the present time. Every strike, every food agitation, every change in the rates of permanent basis.

foreign exchange causes a violent fluctuation in the livestock market. These fluctuations are sufficient in many cases to wipe out all prospective profits and cause more or less loss to the man who is carrying a large amount of livestock in his feed lots. When normal conditions are resumed the cattle feeding business will resume its usual proportions. The farmer who feeds one or two car loads of cattle can then put them into his feed lots for the purpose of consuming the rough feeds and part of the grain produced on his farm. He will conserve the soil fertility of his land, thereby maintaining the productivity of his farm without having to engage in such a wildly speculative game as the cattle business now presents. The difficulty is not the cattle business but the abnormal economic conditions due to the war. Hence, the return of normal conditions will stabilize the cattle feeding of the state and place it on a

"The Vesey Law"

How It Provides for Issuing License for Teachers Without Examination

By G. L. Roberts,

Head of the Department of Education

IN the history of the development of the professions there have been definite stages by which the ascent has been made to the higher levels of definite laws, principles and practices. Each advance has been made by some definite recognition of the requirements of the profession and of the attainments necessary to enter it. Step by step, the requirements have been advanced and with their advancement has gone a more definite recognition of the place and responsibility of the profession. The tardy recognition of the fact that there are certain definite laws and principles which must control in teaching, has made progress toward recognition of teaching as a profession slow and laborious.

The past ten years, however, have seen rapid advancement in the selection, organization and application of certain facts in human development which must be taken into consideration in instructing the individual in such way as to develop, in the highest degree, his native

capacities. As this scientific work has gone on there has also been a recognition on the part of the public of the necessity for establishing standards by which the selection of those persons best qualified to do instructional work might be determined. It is no longer assumed, in general, that more academic knowledge alone qualifies for good work in instruction. This must be supported and supplemented by certain definite lines of professional training which experience and scientific investigation have shown are fundamental to the best instructional work. This progress toward professionalizing the work of teaching has been indicated from time to time by the recognition, on the part of the state, that certain standards or qualifications should be set up by statute, prescribing the conditions under which persons might engage in the work of teaching. Inadequate and insufficient as these have been in the past they have yet served to advance the cause of education.

So far as Indiana is concerned the last and most important of these enactments is known as the Vesey Law which provides for the entrance of properly qualified persons into the field of teaching.

A recent bulletin issued by the Indiana State Teachers' Training Board discusses the new law for issuing licenses for teachers without examination. It states that the Vesey Law (1919) sets a new standard of professional attainment for teachers in the public schools of Indiana. Graduation from an approved teachers' training course, tested experience, and recognized personal and moral fitness, constitute the standard. The ultimate attainment of this standard is designated by the life state certificate which is valid as a license without examination to teach those subjects in which certain requirements have been completed in the regular college course.

May Get Life License.

Without examination, graduates of accredited or approved colleges and four year normal school courses may (1) receive a provisional license for four years, and (2) after two years' successful teach-

ing during the period covered by the provisional license may make application for and receive a life state license to teach the subjects covered by the provisional license.

Approved courses are such courses as have been approved by the State Teachers' Training Board. These must include a total of at least one hundred and twenty semester hours, and a minimum of (a) twenty-four semester hours of prepared work in designated professional studies, and (b) twenty semester hours of prepared work in the subjects in which the certificate is granted, usually the major and minor subjects.

Issued to Graduates.

Provisional certificates are issued to graduates, (beginning with 1919) from approved institutions upon authorization of the State Supervisor of Teacher Training. These certificates must be countersigned by the State Superintendent of Public Instruction and are good for four years. Only graduates of approved courses are eligible to these certificates. Graduates of classes prior to 1919 may not be granted provisional certificates. These grad-

(Continued on page 98)

Marketing for The Diversified Farmer

By C. A. Garner, '21

DURING this era of high prices of food stuffs for the consumer and the unprecedented cost of production for the farmer, intelligent, economical methods of marketing are of mutual interest and of paramount importance in ameliorating prevailing conditions.

Considered from the standpoint of the farmer, relief as well as greater profits undoubtedly lie in improvement in methods of marketing. There are two means by which this may be accomplished: one is by learning methods of selling, as an individual, through the middleman; and the other is by forming a cooperative association composed of a number of farmers who sell their entire produce as the output of a single farm, profits being divided in proportion to the amount contributed to each shipment.

Selling as an individual is usually a disadvantage, but in many districts where general farming is practiced, the forming of a cooperative association is not practicable, since sufficient quantity of any one crop is not produced to market in profitable lots.

However a farmer living in a community of this sort where he is both producer and sales-manager of his crops, can approach the advantages of having membership in an association by making a careful study of the following mentioned parts which go to make up the common market machinery, otherwise known as "middlemen." In this list of middlemen are included brokers, auction companies, carlot wholesalers, commission merchants, jobbers, and others, all of which are extensively engaged in distributing the foodstuffs of the farmer to the consumer.

With the rapid rise of prices in recent years, these men have been a convenient object for scathing criticism since they appeared to occupy a sort of parasitic position in the eyes of those people who are not acquainted with the demand for service in distribution on the modern market. Although it must be admitted that unscrupulous concerns occasionally operate in this as well as other businesses, middlemen as a whole compare favorably with other business men, and contrary to the idea prevalent, are indispensable as long as present market practices are continued. The attention of the public has been directed to increased costs rather than to the services rendered as an agent by which the producer could distribute his food to the retailer and eventually to the consumer. Mr. Wells A. Sherman, Specialist in Market Surveys in the U. S. Department of Agriculture, says, "Evidently it never occurred to many who clamor for reform that economic conditions would not permit the long continued existence of a marketing agency which was simply a parasite. Sooner or later business competition must eliminate all intermediate agencies which perform no definite useful functions."

So the farmer who aspires to learn how to improve his methods of marketing should understand at the outset that co-operation is highly desirable between producer and distributor and that both have important duties to perform in getting food to the consumer's table.

The work of the various middlemen or distributing agencies is the same, the principal difference being the manner in which they choose to accomplish distribution. The broker, for instance, handles carlots, as a rule, and draws his business from country buyers, large operators, and also private shippers. He transacts more business at less cost to himself than any other type of middleman, having no money invested in the stuff that goes through his hands, simply charging the shipper a small brokerage fee for selling his goods. The chief disadvantage of the diversified farmer employing the services of a broker is that he seldom handles less than car-load lots.

For the producer who is shipping in less than car-load quantities, the commis-

sion merchant is the most common outlet. He makes remittances immediately after selling and charges a commission varying from five to twelve per cent, according to the perishability of the goods handled. Commission firms specialize in certain commodities such as eggs, butter, cheese, fruits and vegetables, or poultry and game. Usually each firm will handle any shipment made to it.

Both the broker and the commission man are of interest to the grower because, by expert canvassing of the trade they can make prompt disposition of a consignment immediately upon arrival, often saving the shipper many times their fees.

In case the farmer is making a specialty of fruits or vegetables of fancy quality, sales may be made direct to retailers or to hotels and restaurants. However if this is done, the farmer must perform the services usually rendered by the middlemen who grade and repack products reaching them in unmarketable condition.

Another type of buyer known as the country collecting agent goes directly to the farm buying hogs, calves, butter, poultry, and other farm products which they concentrate into carloads and ship to receivers in the city.

Local country buyers operate, as a rule, in districts producing large quantities of such specialized commodities as apples, peaches, potatoes, cantaloupes, etc. These country buyers usually prove to be profitable connections for shippers, due to the fact that they are permanently located and have reputations to maintain.

Traveling buyers and brokers operating at shipping points work in a similar manner, moving from one specialized district to another, buying almost anything in any amount. They are important for the farmer to study only when he has a specialty he wishes to market.

Many other agencies go to make up our present-day market machinery, but the ones with which the farmer marketing as an individual should familiarize himself are those which have just been mentioned—particularly the broker, the commission man, and the country buyers. Regardless of which of the agencies is selected, sales should not be made to representatives of unknown firms with-

out first making inquiry as to the business responsibility of the firms and as to the accredited standing of the representatives. Further than this, the farmer interested in learning how to market should make a study of all the markets in reach of him to determine which of those to which he may sell is best. After studying the markets and the quotations of the various markets a personal visit to the one to be patronized is highly desirable so that the grower may become acquainted with a reliable representative, to learn the complexity of the distributive system, and to observe the competition which he will have to contend with.

To the man who belongs to a cooperative marketing association the problem of marketing takes on an entirely different aspect, because instead of the farmer selling his own stuff, the manager of the association who is especially trained in that work sells collectively for all producers in his organization as if it were the produce of a large farm.

As yet the number of such organizations is small since the idea is comparatively new, and one, the advantages of which farmers generally have not come to appreciate as much as they should. However, necessity promises to lead the way. Besides, the American farmer is beginning to realize that by selling cooperatively he not only will be able to offer a standardized product and reduce the cost of marketing, but will be able to furnish this better article at the same or even lower price, thus stimulating consumption.

Among the prime requisites in organizing such an association willing, energetic members are first. It is also a considerable advantage if the section in which the association is formed makes a specialty of some one crop, as one of the hardest problems in marketing is to build up a trade in small quantities of practically everything that is raised on the general farm and maturing in small quantities at different times. Of equal importance is the selection of the association manager. A community adopts cooperative methods because it is beyond the capacity of the individual to market as efficiently and as satisfactorily. It follows that a man is required whose experience and capacity

for management are superior to the standard of the farm community. Too frequently a member of the association is selected for the position, but he is usually a producer rather than a marketing agent, with his time divided between private and association business which, of course, is not desirable for either interest.

In order to secure a person of suitable qualifications, a substantial remuneration should be allowed. The position is usually difficult to fill properly because few men have the staying qualities necessary to endure the nagging incident to being the manager of a cooperative marketing association. Whoever is selected should have the confidence of all the members so that he can be vested with large powers. Although not a dictator, he should be allowed to handle the entire business of the organization, subject only to suggestions from the officers and members.

Where a group of farmers wishing to form a marketing organization is too small to permit the employment of a manager they may pool their orders and ship together to advantage if their products are uniform in quality, packing, crating, labels, etc. However, it is imperative that one of the members, at least, be intimately acquainted with correct methods of marketing so as to handle the business side successfully. Even then, such an organization should proceed cautiously, though vigorously, because too much dependence cannot be placed in a manager with little or no salary and divided attention.

Following any plan, the diversified farmer should understand the modern market machinery and how to use it to prevent being cheated if not to improve on his sales methods. *

1920 BASKETBALL SCHEDULE.

- Jan. 10—Illinois at Illinois.
- Jan. 17—Ohio State at Ohio State.
- Jan. 23—Indiana at Indiana.
- Feb. 2—Northwestern at Purdue.
- Feb. 7—Illinois at Purdue.
- Feb. 14—Iowa at Purdue.
- Feb. 21—Wisconsin at Wisconsin.
- Feb. 25—Indiana at Purdue.
- March 1—Ohio State at Purdue.

How I Raised and Fattened a Winning Show Animal

By Harold Fleming, Member of Newton County Calf Club.

The 15th of October I received a letter from Mr. Davis, County Agent of Newton County, asking me if I wanted to join the Boys' and Girls' Calf Club. He said that McCray was getting a carload of calves from Texas and that they would be here about the first of November, so I told him I would join the club. The calves arrived about November 1st, which was on Friday. My teacher excused me long enough to get my calf, which was numbered. There were numbers on each calf corresponding to numbers in a box. I drew the animal No. 38. This calf weighed 290 pounds. I named him Wilson.



Wilson—A Calf Worthy of His Name

Wilson gained 510 pounds from November 1st to April 30th, making an average monthly gain of 85 pounds.

For the first six months I fed him a daily ration of corn, oats, clover hay, silage and oil meal.

On May 15 I turned my calf on pasture. I let him have grass in the day time only, and at nights I fed him his usual ration. He would eat his hay, but he did not eat more than one-third of his grain. I continued to let him have grass throughout May. The feed amounted to \$5.32.

My experience with grass was very nearly a failure as he gained only 18 pounds during this period. Therefore, I decided to discontinue feeding grass and fed more dry feed.

I had a few difficulties, one of which was due to the flies. I overcame this by tacking burlap sacks in front of his pen

and over the windows. I also hung two large sacks from the roof of the pen. This made it very dark and the flies didn't bother very much. Another one of my difficulties was to teach him to stand and lead. I led him every day for two weeks. He soon became accustomed to being led and got so he would stand very well.



The Winner—A Pure Bred "Woodford"

My calf gained 260 pounds in May, June and July at the cost of \$4.50.

The calf made a total gain of 680 pounds at an average daily gain of two and one-half pounds. I sold him at Mr. McCray's stock farm for 22 cents a pound. He made a profit of \$118.58, besides winning a \$300 pure bred heifer given by Mr. McCray as first prize.

CHEAP BEE FEEDER MAY BE MADE AT HOME.

A good feeder for bee colonies is a friction-top honey or syrup can with the lid punched full of holes by an ice pick or small nail. When filled with syrup and inverted over the frames of the hive, in an empty sugar or hive body, the frames about the pail being covered with cloth or bagging to conserve the heat, ten pounds of feed can be easily given a colony in a day or two, sufficient in most cases to make good stores an assured reality. There is no better or cheaper feeder than this. Don't spend money for special or expensive feeders, says E. G. Baldwin, entomologist on the Purdue University extension staff.

Farmers' Co-operative Elevators

By C. U. Gramelspacher, '21.

THE main force back of the Farmers' Co-operative Elevator movement is of course an economic one, expressing itself in price. Most of the companies have organized as a result of the general belief that the established dealers were taking too wide a margin. This, however, in many cases was found to be untrue. This belief was fostered by the fact that in a number of places where farmers' companies were well-managed, higher prices were paid than in neighboring towns. Farmers in one community, finding prices a few cents higher in neighboring towns which had farmers' companies, would get together and form a company of their own, either building a plant or buying out an established business. In a few cases farmers' companies have been started as a result of an offer to sell out made by some grain dealer.

To some extent the movement has been furthered by paid organizers or promoters. Co-operative efforts thus started are probably less likely to succeed than if the demand and exertion came from within. Such promoters are often inclined to make exaggerated and misleading claims, and to play upon the prejudice of farmers, a practice which is likely to lead to disappointment and possible failure. This class of people guide in the direction of their interests and are interested in the organization because of their commissions. In the main, however, the movement seems to have been from within, a spreading from community to community as leaders in various communities learned of what was being done elsewhere—the only condition under which a farmers' co-operative elevator should be started.

The line of distinction between co-operative elevators and others is not always sharply drawn. It has been deemed proper to include with the co-operative elevators all concerns in which the farmers own at least 50 per cent of the capital stock.

There were on January 1, 1916, two hundred and ninety-six co-operative ele-

vators in the state of Minnesota (using Minnesota as a representative state). This is about one-fifth of the total number of elevators and local mills buying grain from farmers, or 1,428 local elevators and mills buying grain from farmers in 1914-1915.

Of the 296 farmers' elevators included in this list, information concerning the year of organization is available for 204. One dates back to 1876 and another to 1884, but the total number reported as organized before 1900 being only thirty. Marked activity in the formation of co-operative elevators appear from 1904 to 1906, and again from 1909 to 1914, the years 1912 and 1913 showing a greater number organized than any others.

Much interest is attached to the local distribution of co-operative elevators and the proportion of the total grain handled by them.

As would naturally be expected, there are in general more co-operative elevators in the regions of large grain production than elsewhere.

The 1,428 local elevators and mills buying grain from farmers handled approximately 112,000,000 bushels of grain during the crop season of 1914 and 1915. Of this amount the farmers' elevators, numbering one-fifth the total number of elevators and local mills, handled over 43,000,000 bushels, or nearly two-fifths of the grain.

The majority of co-operative elevators handle commodities other than grain. This part of the business consists largely in buying supplies of various kinds in large lots to distribute among members and other customers. In other words, it is a purchasing rather than a marketing function. Moreover, a few co-operative elevators market for their members and patrons commodities other than grain, such as livestock and seeds.

Coal, seeds, feed, twine, wood, tile, lumber, cement, oils and machinery are commodities more or less frequently distributed by co-operative elevators, though seldom does a single concern handle all those listed.

Those elevators which handle commodities other than grain totaling less than 15 per cent of their gross receipts operate at a lower cost due to better distribution of labor throughout the year. When the commodities other than grain and flax exceed 15 per cent the operating expenses increase due to extra help and equipment.

It should not be concluded, because the operating expenses are larger, on the average, where the proportion of commodities other than grain and flax exceed 15 per cent of the gross receipts, that it is not advantageous for the elevators to deal in such commodities in excess of that proportion. It may very well be that the cost to the patrons of such commodities is less when handled by the elevators than it would otherwise be, even if they are more expensive to handle than grain and flax alone.

There are two types of organizations. The first are simply incorporated companies in which most of the stock is owned by farmers. Some of these, for example, are operated by a few prosperous farmers as business ventures.

The second type, and the one we are most interested in, consists of the co-operative companies, corporations with certain co-operative features which tend to make membership of more importance than capital stock.

The co-operative features are: 1, Restricted ownership of capital stock. 2, Limiting voting privileges. 3, Patronage dividends.

1. Limited ownership of capital stock. There are relatively few farmers' companies that do not embody some degree of co-operation. The most usual co-operative feature is that of restricted ownership. The main reason for wishing to restrict ownership of stock is, first, to prevent the shares from falling into the hands of just a few and generally of those who are interested in greater profits and, second, to keep the shares as widely distributed as possible among the producers.

2. Limiting voting privileges. The most common method is the one-man-one-vote plan. The same reasons holding as for restricted ownership.

3. Patronage dividends. The patronage dividends is often considered the

acid test of true co-operation. By means of it all profit is returned to those from whose business it has resulted, each man getting the proportion which his patronage is supposed to have created. The provision for the patronage dividends, or business dividends, as it is sometimes called, provides for the distribution of only that proportion of the gross gain of business which remains after all expenses have been met, dividends declared on capital stock, and provisions made for any addition to the surplus fund.

Where the patronage dividends is in use there is usually a provision limiting the per cent of dividends which can be paid on the capital stock. The per cent of dividend varies greatly, but a 3 per cent limit is usually used. The purpose of this low limit is to discourage investment from those seeking high dividends rather than only a satisfactory market for their products.

The capital stock is usually between \$10,000 to \$30,000 and the membership averages around 125, although it varies from as low as 38 to as high as 400.

The size of the share of stock is often made small to enable men of small means to become stockholders. This aids still more in getting the stock well distributed.

The capacity of the elevators vary usually from 5,000 up to 60,000 bushels, the average being around 20,000 bushels.

Many of the farmers' companies are managed by men who have had little or no experience in the elevator business. Others are managed by men with considerable previous experience. Over emphasis can not be given the fact that it pays better to hire an experienced manager than a lower priced man with less experience and managing ability. Most managers are bonded.

There are four methods of buying grain: 1, Paying the flat price. 2, By grade, basis uncleaned grain. 3, By grade, basis of cleaned grain, screenings retained by elevator company. 4, By grade, basis of cleaned grain, screenings returned to the farmer. This method is the best and only one to be followed.

Prices of the different elevators vary with the method of buying. Most of the companies provide for an audit. The external audit is coming to be the most

usual, that is, an audit made by an experienced accountant as compared with the internal audit where the audit is made by the members of the concern. Uniform accounting methods would facilitate auditing of the books.

Absolute Requisites to Successful Farmers' Co-operative Elevators.

1. Absolute loyalty.
2. An organized membership on stock basis.
3. Limited stock ownership.
4. Voting be upon membership and not by stock.
5. Necessary capital.
6. Management by competent manager or board of directors and not by membership.

ger or board of directors and not by membership.

7. Division of profits. (a) Pay capital the legal rate of interest. (b) Prorate the profits on grain to grain. Prorate the profits on supplies to supplies.

Transact all business at a reasonable profit. Buy and sell to all alike. Arrange the by-laws so that all profits on membership business must be given back. To whom? To the man from whose business it has resulted. This is true co-operation.

(Credit is given to Minn. Experiment Station Bul. No. 164 and Ohio Experiment Station Bul. No. 331 for some of the material used in this article.)

The European Corn Borer

By Prof. J. Troop.

The European Corn Borer (*Pyrausta Nubilalis*) is one of the most destructive corn insects which has found its way into this country for many years. It is supposed to have been introduced from Europe into New England in shipment of hemp or broom corn, and is now known to cover an area of three hundred and twenty square miles around Boston, and an area of four hundred square miles in the vicinity of Schenectady, N. Y. It has spread rapidly and there is a general belief that it may be found in other states. So far as known, it has not yet reached Indiana or any of the states in the "Corn Belt" or the middle west, but, so great is the menace thought to be, steps are being taken to prevent such a catastrophe, by either quarantining against infested states, or by providing strict inspection rules which must be complied with before corn can be shipped from infested districts into these states.

In order to prevent it from becoming established in our own state the cooperation of every farmer and grain dealer is asked in the matter. In order to assist in discovering the insect if, perchance, it should find its way here, a brief description of the borer is given here:

The borer is a yellowish grey cater-

pillar, covered with very small brown spots, and is about three-fourths of an inch long when full grown. There are two broods annually. The first brood damages the very early sweet corn when it is beginning to tassel. The second is found in the field crop. During the fall and winter the insect is most easily found in stalks that have been stripped of leaves by cattle, or in the corn stubble. Its presence is indicated by characteristic holes about an eighth of an inch in diameter, generally discolored margins and usually plugged with borings. The boring into the stalks and the stem of the ear weakens the plant, prevents the development of a healthy ear and may even cause extensive lodging and almost total loss of the crop. The work of the pest in the ears makes them unfit for human food and seriously affects the value of the crop.

As the larva may bore into the center of the ear and there pass the winter, it is especially urged that all ear corn which is procured for seed, be carefully examined for any holes in the cobs before putting it away for the winter. Any suspicious looking specimens whether ears or stalks, should be sent at once to the Entomology Department, Purdue University, Lafayette, Ind.

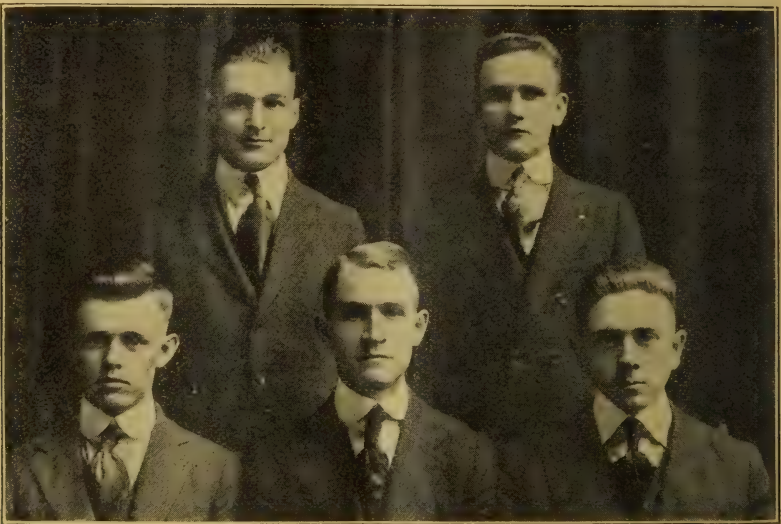
L. A. Jessup Wins \$400 Jersey Scholarship

Purdue Team Competes for First Time in Cattle Judging at National Dairy Show. This Year's Show Largest Ever Held

L. A. Jessup, Senior in Animal Husbandry, won the \$400 Jersey Scholarship offered by the American Jersey Cattle Club, to the high man in Jersey judging at the Students' Dairy Cattle Judging Contest held October 6 at the National Dairy Show. This scholarship is offered by the American Jersey Cattle Club each year at the National Dairy Show and en-

abled the schools which these teams represented were as widely separated as Washington state and New Hampshire and South Carolina and Minnesota.

The Purdue team was made up of B. F. Sellers, J. M. Kirkpatrick, L. A. Jessup and O. B. Riggs. The other members of the team while not so successful individually as Jessup, did good work and



DAIRY PRODUCTION TEAM

First Row—Kirkpatrick, Sellers. Second Row—Jessup, Fairchild (Coach), Riggs

ables the winner to make use of \$400 in a year of graduate work at another University. Jessup was high man on the Purdue team and high man over all contestants in judging Jerseys. He did not limit himself to first place in Jersey judging but was also eighth man in the contest in judging of all breeds.

The National Dairy Show was held at the Stock Yards Amphitheater in Chicago during the week of October 6 to 12, after an absence from Chicago of five years. The Students' Dairy Cattle Judging Contest took place on Monday, October 6, and the increased interest in the contest is shown by the fact that this year—the thirteenth annual show—fifteen teams were entered as compared to one team present the first year of the show,

enabled Purdue to place ninth among the fifteen teams competing. In addition to this rank on all breeds, the Purdue team placed third in the judging of Guernseys, a very remarkable showing since, except for a few animals in the Purdue herd, all the Guernseys seen by the team were those on farms visited in Wisconsin.

Prior to the contest at Chicago an inspection trip was made by the team up into Wisconsin. On this trip opportunity was given to see and judge some of the best dairy cattle in the world. At Milwaukee, plants of the Gridley Dairy company were visited. These plants furnish the larger part of the milk for Milwaukee and are models in efficiency and cleanliness. Most of the dairy farms visited were in Waukesha county and it was

a revelation to the Indiana boys to find that such large numbers of high class cattle could be in one county. At the farm of F. E. Fox, the grand champion Guernsey cow at the Wisconsin State Fair was seen and at Baird Brothers' farm the Holstein cow which stood second at the Milwaukee Fair. But show cattle were not the only kind seen. At the farm of Wm. Jones a class of four aged Guernsey cows was judged whose average yearly production was 824 pounds of butterfat. Pabst farm at Oconomowoc was visited and the men were shown a young Holstein bull that was purchased when a calf for \$12,500. This is one of the larg-

est dairy farms in the world. At Edgewood farms at Pewaukee, the home of Rag Apple Korndyke eighth, the \$100,000 Holstein bull, was seen. The Carnation farm at Oconomowoc was also of great interest because at this farm is owned Carnation King Sylvia, the Holstein bull for which at six months of age, \$106,000 was paid.

The work of the team at the show this year is a very creditable performance for the first year's competition and in appreciation of the work done by these men, the State Dairy Association will present gold medals to the members of the team.

The Dairy Products Team

By Prof. Gregory.



DAIRY PRODUCTS TEAM

First Row—Roberts, Cy Tang. Second Row—Schmidt, Gregory (Coach), Horrall.

The Purdue University Dairy Products team took second place at the National Dairy Show held at Chicago from October 6 to 12. Considering that this is the first time that Purdue has entered a team in a judging contest of this nature, the boys made an excellent showing. The team was composed of R. E. Roberts, B. E. Horrall and F. K. Schmidt, all junior dairy students.

The products judged were butter, cheese, and milk, and there were seven teams, representing the following schools, Ames, Nebraska, Ohio, Maryland, New York, South Dakota, and Purdue. Each

team was composed of three men, making a total of twenty-one individuals entering the contest.

B. E. Horrall, of Purdue, won third place in the individual judging, and was given a valuable watch fob, awarded by the National Dairy Association. R. E. Roberts won ninth place and F. K. Schmdie won eleventh place in the individual judging. The team was coached by Prof. Gregory and Prof. Lucas.

The team from South Dakota won first place, Ames, third, Ohio fourth, Maryland fifth, New York sixth, and Nebraska seventh.

Cattle Lice and Their Eradication

By J. B. Oylor '20.

THE distribution of cattle lice is widespread and has been considered a pest to cattle by the stock raiser for many years. They occur in all parts of the United States especially where large numbers of cattle are crowded together in poorly ventilated and unsanitary stables. On the western range cattle often become very badly infected with lice, the seriousness varying from one year to another with changes in the climatic and other conditions. As a usual thing lice are not observed on cattle until their presence causes signs of annoyance. Poor, weak, unthrifty members of the herd are the first noticed and sometimes the farmer thinks they are lousy because in low condition when in fact they are poor because they are lousy. The individuals in a herd are not usually equally affected as some seem more or less immune. However, when lice get in a herd during the fall they usually spread until nearly every animal is infected. The tissues of the host serve as food for all lice and the irritation caused by the lice is evidenced by the animals seeking to obtain relief by rubbing on fences and buildings.

Calves, young stock, and old or poorly fed stock are most subjected to the ravages of lice. Badly infested calves will not grow or make gains normally in winter and often remain stunted until spring when the old coat is shed. At this time most of the lice leave. Although mature cattle when in good health do not suffer as much with lice they show a marked loss in the production of either meat or milk. Under any condition the loss caused by lice is enough to warrant intelligent efforts to eradicate them.

There are three kinds of lice commonly found on cattle in the United States. Of these two are blood suckers and are known as "blue lice." The third species is a biting louse and known as "the little red louse." Of the two sucking lice one has a short nose and the other a long nose. The short nosed louse (*Haematopinus eurysternus*) most often attacks mature cattle but may be found

on calves and young cattle. The adult female is about one-eighth of an inch long and the body is about one-half as broad. Males are slightly smaller than the females. The head is short, nearly as broad as long, and bluntly rounded in front. The head and thorax are yellowish brown, while the abdomen is blue slate colored.

The various stages of the life cycle are passed upon the animal infected. The "nits" are fastened to the hairs near the skin and hatch in 11 to 18 days. The average period of incubation in mild weather is about 14 days. The young female begins to lay eggs on about the twelfth day.

The long nosed cattle louse (*Linognathus vituli*) usually is found on young stock and calves, but sometimes occurs on mature cattle. In the adult stage the two types of sucking lice have about the same color but they may be distinguished quite easily. As implied by the name the long nosed louse has a long, slender head, and as the body is only one-third as broad as long the entire body is given a more slender appearance than that of the short nosed louse. Like the short nosed louse, the long nosed louse spends its entire life cycle upon the host and deposits its eggs upon the hairs. These hatch in 10 to 14 days and the young female begins egg laying at 11 days of age.

The biting lice of cattle (*Trichodectes scalaris*) occur on both young and mature cattle. They are not as large as the sucking lice but are large enough to be seen. "The head is broad and blunt, the color is reddish, that of the body commonly yellowish white." They can be distinguished from the sucking lice by the shape of the head and the body and by their color. The life history is similar to that of the sucking lice.

Each species of farm animal is subject to its own particular species of lice and unless by accident cattle lice occur only on cattle. When the cattle are in winter quarters and the hair is long, lice increase rapidly. During the summer after the old coat of hair is shed only a

few lice remain on the animal and only slight damage is done. Then again with the coming of winter the lice begin to multiply rapidly. It is evident therefore that the logical time to treat cattle to eradicate lice is in the early fall before the number becomes large and injury results.

Sucking lice usually select some protected spot where the animal cannot easily dislodge them. The most common places are the sides of the neck, on the brisket, back, inner surface of thighs, and around the eyes and ears. The biting lice are usually found on the withers and around the root of the tail, but may occur on any or all parts of the body. They do not irritate cattle as much as sucking lice. The biting lice will live about seven days separated from the host and the sucking lice only about four days. Eggs are not as a rule laid anywhere except on the host, but when the hairs to which they are fastened are removed and kept under favorable conditions they may continue to hatch for twenty days. The newly hatched lice will live only two or three days off the host.

The length of life and viability of their eggs when off the host are closely related to control measures. It is found that only a temporary infestation of lots and barns can occur. All grounds and barns must be thoroughly cleaned and disinfected if clean or freshly dipped cattle are put into them or else they may be held vacant for at least 20 days. "The long nosed sucking lice and the biting lice are much more easily eradicated than the short nosed sucking lice. One treatment with coal tar or arsenical dip will eradicate the two former, but as a rule one treatment does not eradicate the short nosed sucking lice. Sometimes two treatments will fail." To insure complete eradication of all three it is advisable that after two treatments 15 days apart, that a careful examination of the cattle be made and a third dipping given if any are found.

Three commonly used methods of treating cattle for lice are: (1) Hand applications, (2) Spraying, (3) Dipping. The best method will depend upon the season of the year, remedies selected, the

number of cattle treated, and the available facilities. All of the individuals in the herd must be treated regardless of the number showing infection. Otherwise the herd may very probably become reinfected by contact with those having only a few.

Hand applications: Dusting powders have an insecticidal value because of the naphthalene and pyrethrum which they contain. Rubbed into the hair they are valuable to hold in check the parasites when the weather is too cold for the application of sprays or dips. Greases and liquids of home mixture are sometimes effective and practicable when a farmer has only a few animals to treat and can do the job himself. The following remedies have proven effective: (1) Cottonseed oil and kerosene, equal parts, (2) Kerosene and lard mixed in proportion of one-half pint of kerosene to one pound of lard, (3) Any of the recommended dips.

Spraying: The farmer who owns too few cattle to justify the use of a dipping vat may use a hand spray pump such as is used for orchard spraying. Any of the standard dips recommended for lice may be used as a spray and if the job is carefully done all the lice can be eradicated. Thoroughness must be the watchword in any spraying operation. All portions of the animal's body must receive a maximum wetting, special attention being given the head, ears, brisket, tail, and inner surfaces of the elbows, flanks and thighs. When arsenical dips are used care must be exercised that the animal and operator breathes none of the spray. The operator should avoid getting his clothes wet with the spray material also.

The dipping method consists in immersing the animals in a medicated solution which will kill lice, and is the most successful means we have for lice eradication.

When a dip is being selected the condition under which it will be used must be considered. If soft water is available any dip recommended for lice may be used; but if very hard water is to be used the dip that mixes best with hard water should be selected. The arsenical dips

(Continued on page 98)

The Federal Farm Loan Act

By E. H. Moss '20.

WITH the passing of what may be called the pioneer or formative period of American Agriculture toward the end of the nineteenth century, the need of an efficient system of financing agriculture began to be more and more obvious. By the opening of the twentieth century free land had largely disappeared, and land values began to be more stable. Farmers began to appreciate the advantages of better farming methods, but were handicapped by lack of funds and credits. Farmers had not had the same freedom to get credit on their real assets that those in other businesses had enjoyed.

According to the census of 1910, 33.6% of farms in the U. S., operated by their owners, were mortgaged. The mortgages averaged 27.3% of the value of the farms mortgaged. These mortgages were held by banks, insurance companies, mortgage companies, and private individuals. Most of these loans were for periods of from three to five years, and the interest rates varied widely, in many cases being far too high. In 1915 a congressional committee was provided to study the situation and suggest legislation. This committee submitted a bill which became a law July 17, 1916.

The complete title of the act is, "An act to provide capital for agricultural development, to create standard forms of investment based upon farm mortgage, to equalize rates of interest based on farm loans, to furnish a market for U. S. bonds, and to create government depositories and financial agents for the U. S.

The act provides for a Federal Farm Loan Board, a system of Federal Land Banks, and National Farm Loan Associations. While the system is distinctly individual as to administration, it is designed to supplement and articulate with the Federal Reserve System. The Federal Farm Loan Board is given supervision over a Federal Farm Loan Bureau to be established in the Treasury Department, and is to have charge of the operation of the new act. The board consists of the Secretary of the Treasury as ex-

officio chairman, and four other members to be appointed for a term of eight years.

The United States is divided into twelve Land Bank Districts. Each district has a Federal Land Bank which is to be capitalized at \$750,000. Branch offices are established as needed.

National Farm Loan Associations, which are local associations, are to be chartered by the federal board on recommendations of the district bank. Membership is limited to actual or prospective farm owners of a given locality who wish to borrow money on a farm mortgage security. Ten or more persons are required for a local association, and they must each borrow not less than \$100, or more than \$10,000, and their total borrowing must be at least \$20,000.

One cannot borrow an amount exceeding half the value of the land based on earning power plus one-fifth of the value of the permanent insured improvements. The loan can only be made for the purpose of purchasing land, equipment, fertilizers, live stock, provisions, buildings and improvements; or for liquidating existing debts. Loans are made only on first mortgages and for a period of from five to forty years. Interest is not to exceed 6%. Payments are to be made on the amortization plan. This provision enables the farmer to secure loans conveniently at interest rates which he can afford to pay, with the added advantage of extending the period of payment over a number of years without the necessity of costly renewal at frequent periods. At the same time opportunity is given after five years to pay more than the required amount per year.

In communities where farm loan associations have been formed, the land bank may employ an incorporated bank, trust company or mortgage company as agents. The agent must endorse all loans, and receives actual expenses plus a commission not to exceed 5%.

The securities sold under the authority of this act are exempt from federal, state, and local taxes, and their sale furn-

(Continued on page 100)

ROVER'S ROVINGS

I WRITE THIS

HELLO FRIENDS:—Is this a busy time? Well I guess yes. Jack and I have been so busy at our farmacy since September 10, that we haven't even had time to go home over the week-end. I'm anxious to be going too for I want to see Tim. Since I wrote you the last time a lot of the boys and girls have written to me and told me a lot about what they have been doing. Some of the letters were so interesting that I am going to show them to you for they sure tell plainly what kind of work the boys and girls are doing. I think that the following letter is good in more ways than one.

Dear Rover:—

I have been very much interested in reading your letters about club work and am going to tell you about my pig. In entering my "Queen" in the pig contest it is with the feeling that she is truly a Queen and with confidence in the judgment and fairness of the gentlemen who are conducting this contest I know they can't help but see the good points I am writing of.



The Queen—Built Like A Packard With A Contralto Voice.

Mother says Venus is the highest type of beauty and I don't know just who Venus is, but I do know that my Queen surely is the Venus of hogs. I have been with Queen every day since this contest began and I know she and I have had to fight a big flock of chickens every meal

in order that Queen might get even a small part of her food. I am fond of autos and what they say about them can be said truthfully about Queen. She is built sturdy, close to the ground with lines like a Packard, and a full 32-inch wheel base, which I think is good for a hog, at least she carries her weight gracefully.

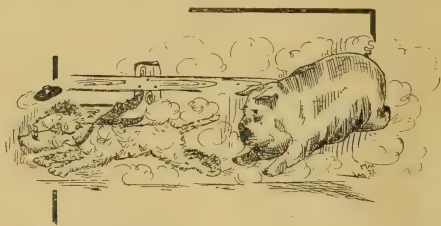
Sister says Queen doesn't grunt but has a rich contralto voice, but I'll be truthful to the judges, I think her voice is bass and not very musical. I think it is changing. Queen has been looking forward to this day with pleasure. Every time she sees me preparing her food her eyes just dance. I hope judges will notice her eyes—nobody seems to care for hog's eyes. My uncle says you can't eat pig's eyes and there is no money in them and that's why nobody pays any attention to them. My Queen's are dark brown and are part of her beauty. She has a Roman nose like the lady on a dollar and a strong, firm chin, which means that Queen is really somebody of note and a royal lady among hogs.

Whether I win a prize or not I have found out something I would never have learned at school, besides Queen and I have had great sport together. I will come up to Purdue to see you before the winter is past. Sincerely yours,

Johnny C.

Isn't that a good letter? I think it is just dandy, for Johnny is only ten years old and this is his first year in a club. I never saw Queen, but this picture looks like she had any Packard beaten as far as lines are concerned. There are some pigs that can sure make a lot of noise with their voices, but I never heard any that were musical enough to appear in public. Some hogs do have pretty eyes though, but I found out that they are sometimes very deceitful. The other day I was out on the Purdue farm and stopped

to look at some little pigs. I started talking with them and their mother came up and I thought that she was smiling very pleasantly at me, when all at once she made a dive at me and I was lucky to get away with a whole hide. After this I am going to look very carefully at any pigs' eyes before I go close to them. I don't know exactly what to think about that Roman nose that Johnny said Queen



Hog Eyes Do Not Always Tell Their Disposition.

had, but it seems to me that a Roman nose would be very good to root with and would hold an awful lot of high priced rings. I have heard the professors say that pigs should have firm chins and jaws so that they can chew their food well and get fat. I don't want to be fat myself, but I have heard that the fatter the pigs are the more money they will bring. You ought to see how fat a lot of them are out on the Purdue Farm.

Sometimes, boys and girls, I feel like quitting work and study, but when I get letters like that one from Johnny I get rid of all such thought at once. Such letters show very plainly that all of the boys and girls that live on farms nowadays are taking advantage of the opportunities that are offered them and are doing a lot of good work. I realize what a fine thing the clubs are and how well they give all the young people a chance to learn and develop along lines that will be of real service to their fellow-men. So I have decided to work hard and faithfully at my course and keep an eye open for the funny things that will make work easier and more interesting. I would like very much to get some letters from others of you about what you are doing. From what I have been hearing the last few days there will be big news for next month. Your pal,

Rover.

THE MOTOR TRUCK ON THE FARM.

With Indiana's extensive program for better roads well underway, the automobile is becoming more and more a part of the complete farm equipment. The farmers, dependent as much on a rapid access to his market as on the productivity of his farm, finds the motor truck coming to his aid at a time when he can not hire farm hands. A truck will carry twice the load in half the time. It will make available for other production five acres of land whose yearly crop is now required to feed a horse.

Sixty per cent of the output of some motor truck manufacturers is sold to farmers. A report of the Bureau of Statistics of the Pennsylvania Department of Agriculture shows that 27 per cent of the farmers own automobiles. In a number of counties 35 per cent of the farmers are owners, but Philadelphia county leads with 55 per cent, and Delaware county is second with 45 per cent.

To ascertain the underlying motive behind the purchase of an automobile by a farmer, an investigation was conducted among farmers owning automobiles in Livingston county, Illinois. The facts brought out by this investigation were as follows:

Seventy-three and one-fifth per cent said they bought their automobile as a necessary part of their farm equipment.

Twenty-four and two-fifth per cent said they bought it for business and pleasure.

Two and two-fifths per cent said they bought it for pleasure alone.

At the end of 1917 there were more than 5,000,000 motor cars in use in the United States. From two to three times as many automobiles are owned, in proportion to population, in the agricultural belt, the Central and Middle West, as in the States of the East. These later figures furnish evidence that the farmer appreciates the facilities for quick and convenient transportation offered by the motor truck. The above figures may well be pondered over by the modern farmer, and with them in mind, let him analyze his system and find if it might not be improved by the use of motor power in transportation.

Finishing Poultry on the Farm

AT this time of year there is much poultry being sold on the local markets by the farmers and poultrymen. In what condition are these chickens when they reach the market—can they be dressed and marketed at once or must they be fattened in order to make them fit for the city markets? The answer to this question is very evident and by visiting any poultry plant and seeing the large equipment in use in the fattening rooms we at once realize that all the poultry they handle is given a certain finishing process before it is dressed and sold on the market.

It has been said by some of our large poultrymen that the proper place to fatten poultry is on the farm where fattening can be—as it should be—just a continuation of growing the poultry; or in the case of old birds—a variation from the feeding methods used for stock birds that will improve their flesh with the least trouble and cost.

The practice of fattening at packing plants has grown up because farmers could not, except in a very limited number of cases, take the trouble to put their poultry in good market condition before selling it. So the only way the dealers could get good fat poultry in quantity was to fatten it themselves, as well as they could in the short time it could be held cooped before killing.

There is a profit to the dealer in doing this, but it is on the whole not very large, because a large number of the birds will not make profitable gains under the conditions at the fattening station.

There is much risk in handling poultry in large numbers, for when birds are brought in daily from many different places, disease may be brought in and spread to large numbers before it develops to a stage where its presence will be noted. There is no practical way to avoid this danger. A poultryman buying new stock can quarantine it as long as necessary, but the period that stock can be held and fed in a fattening station is no longer than the usual quarantine per-

iod. It is also impossible to isolate the birds of each lot purchased from every other lot.

The producer who fattens his own poultry and sells it directly to consumers can nearly always get some premium over the price paid for ordinary poultry at the poultry houses. He may sell easier and get a larger premium if he is the only producer of poultry of that quality in his community, or if the supply is insufficient for the local demand for choice poultry. If sold on the regular market the dealer may appreciate the quality of the stock but as he would only be able to get a small quantity at a time he could not afford to pay a price above that paid for ordinary stock.

If a number of farmers in a community will make it a point to finish their poultry properly for the table, making the supply of good poultry in that vicinity large enough to attract buyers of that class of poultry, either the competition of buyers will raise the price or the farmers can cooperate in marketing and get the highest possible market price. It is not necessary to have a guaranteed market, for if you have the goods that the people want there will be a market and the price will be right. The larger the supply the easier it will be for the producers to get satisfactory selling arrangements.

Methods of Fattening on the Farm.

If the birds have been grown on range as is the general farm practice the feeding period should be divided into two periods. The first week they should be allowed access to a yard with green feed, and then about an equal period in close confinement. A ration of whole or cracked corn and a mash made of cornmeal moistened with skim milk or buttermilk is sufficient for the fattening. The grain should be kept before them at all times and the mash fed in troughs twice per day. The mash should be fed so that the birds will clean it up in about fifteen minutes and the troughs should be removed and cleaned after each feed.

Household Conveniences

By Inez Richardson,

Assistant State Home Demonstrator Leader,
Division of Home Economics, Purdue University.

“EFFICIENCY” has become the watchword of the modern housewife as surely as it is the slogan of the successful business man.

In seeing her work in this light she looks upon her house as her workshop, where her larger profession, “home making” must be worked out. A good workman insists upon having good tools, oth-

tired, overworked housewife and one who has time and energy left for recreation after the day's work is done.

Working Surfaces.

The height of a woman's kitchen sink and work table is an important factor in her well being and well doing. She can't do as much or as good work and feel well



A Well Arranged Kitchen

erwise his finished product is of inferior quality, and it is just as necessary that the housewife have a convenient workshop and good equipment, or we cannot expect her's to be a home of superior quality.

Since the kitchen is a very important part of this workshop, short cuts and conveniences make the work there a pleasure rather than a drudgery.

No woman should adopt the plan of some other woman's kitchen without first assuring herself that it will suit the special needs and tasks of her family. However, there are certain general principles which deserve study in planning a new kitchen, or in replanning one already built. Such consideration and study can easily make the difference between a

and strong with her sink and table so low that she has to bend over to work, or so high that she has to “reach up” as she would were they the proper height.

As a general rule, the following table may easily be followed, however, each woman ought to find out for herself the height of the table at which she can work most easily and efficiently, and see that her work tables and sink are adjusted accordingly.

Heights of Working Surfaces.

Heights of Woman.	Heights of Working Surfaces.
4 feet 10 inches.	30¾ inches.
5 feet	31¾ inches.
5 feet 5 inches.	34½ inches.
5 feet 7 inches.	35 inches.
5 feet 10 inches.	37 inches.

Built in Conveniences.

A kitchen should be used for the preparation and cooking of food. It can be much smaller and more compact than in our grandmother's time, when it served as living room, laundry and general purpose workshop.

The small compact kitchen is the first step toward saving time and energy in that part of the workshop. Less wall and floor space are to be cleaned, and all working processes are near together. The built in conveniences make the small compact kitchen possible.

5. Nothing should be permitted to rest on the floor.

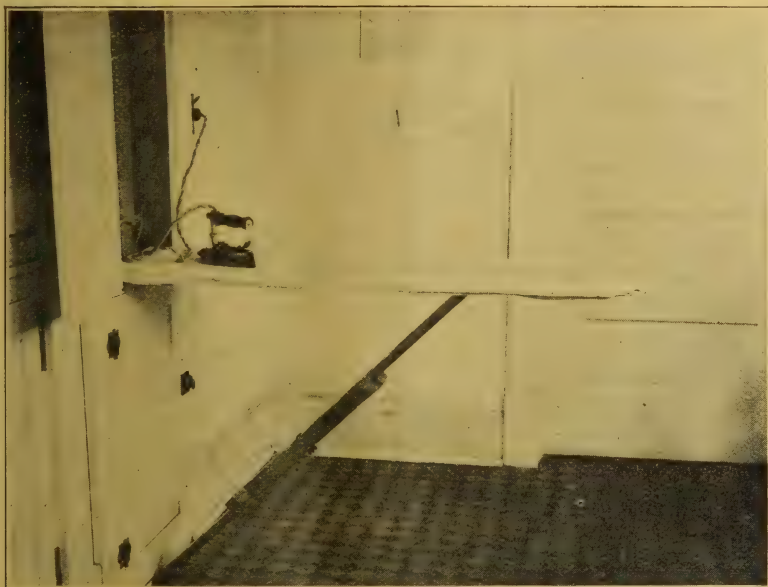
6. Everything in the kitchen should be easy to keep clean.

7. Fixed equipment should be placed where the light is good.

8. Small utensils should be suspended from hooks and cup hooks fastened to the wall or the edge of shelves.

9. Sink and work table should be at a convenient height for the worker.

10. Have a special place for everything used in the kitchen.



Why Not A Convenient Ironing Board?

Measurements, standard sized ironing board:

Heights of board, 35 inches from floor.

Leg, 1 inch by 4 inches by 48 inches.

Wall board, 1 inch by 6 inches.

Two inch, 4 inch strap hinges.

Leg hinged on board 34 inches from base.

Principles of Kitchen Efficiency.

1. Keep nothing in the kitchen that is not used every day.

2. Things used most frequently should be most conveniently near at hand.

3. Group utensils and supplies by the principle of co-ordination of process.

4. Shelves should be at convenient height and width, none lower than 12 inches, none wider than 4-6 inches.

INTERNATIONAL NEWS NUBBINS

November 29th will be "College Day" and the Junior Live Stock Judging Contest will be held.

This is the Twentieth Anniversary of the International, the biggest, best brightest show.

A new feature of the International this year will be a Grain and Hay Show.

Brilliant Horse Show every evening.

Many states are planning to have educational exhibits in connection with the Grain and Hay Show.

There will be a Non-Collegiate Live Stock Judging Contest.

Learn to reduce the high cost of living by studying intimately the art of breeding and feeding.

There will be a "Round Up" of all the exhibitors at the first International.

The U. S. Department of Agriculture will have a large exhibit in connection with the Grain and Hay Show.

The exhibit of draft horses this year promises to be the largest ever held.

Attend the Victory Carnival of the Live Stock World, the first week in December.

See the Aristocrats of the Live Stock World on exhibition at the International Amphitheatre and twenty additional buildings.

There are several special trains coming to the International from the Pacific Northwest. South and North Dakota are to send eight or nine special trains to the International.

Attend the Great Twentieth Anniversary Show the first week in December.

State exhibits have been arranged for and these will present the best ideas gained from experimental and demonstration work.

County agents and other extension forces in the several states are giving active co-operation in securing exhibits to compete for the \$10,000 in cash premiums offered by the Chicago Board of Trade at the International Grain and Hay Show, Chicago, November 29th to December 6th. During the months of October and November many hundreds of local shows and community fairs are being held throughout the middle west. The winning exhibits are being marked and exhibitors are being interested in the show at Chicago and arrangements are being made to forward these many exhibits. In this way a high quality of corn, small grains and hay will be secured. The county agents, who are trained men, are giving assistance in the better selection of samples and are even taking back some of the winning samples in the shows, eliminating poor ears of corn and replacing them with types that improve the exhibit and make for a stronger show. There is every evidence that there will be a large number of exhibits and an unusually close competition. Farmers everywhere are urged to get in touch with the county agents and to secure their assistance and co-operation in arranging for exhibits to be sent to the International Show.

GOVERNOR LOWDEN'S ANNOUNCEMENT

Frank O. Lowden, war governor of Illinois, a recognized presidential possibility and an ardent champion of the live stock industry, a charter member of the International Live Stock Exposition and actually engaged in the campaign for the improvement of American live stock, commenting on the present and prospective status of the industry, remarked:

"Twenty years ago when the first International Live Stock Exposition was held at Chicago the institution was no more essential than at this moment. During that two-decade period the industry has been through a period of evolution; each season has developed new production problems, both in the spheres of breeding and finishing. Foreign competition, especially in the case of beef, has become of serious import, rendering maximum results imperative. A brief era of free grass and cheap grain has passed into the historical stage; making gains with cattle, hogs or sheep has enhanced in cost until even with the new scale of values the industry can be profitably maintained only by intelligent methods, and the lessons annually taught at Chicago during the first week in December therefore possess added import.

"The problem confronting the American live stock grower at this juncture combines economical feeding with improved breeding; therefore, the new departure providing for a comprehensive display of such grains and grass products as are essential to the manufacture of beef, pork and mutton on the farm is a timely innovation. The 'International' has kept pace with every mutation of the industry during its twenty years of educational effort and in the hands of the public-spirited men who chart its course, will continue to discharge that function.

"We have emerged from the period of waste to one of highly intensified, systematic production in which only the fittest can survive if financial results are to be the objective. Feed is more than ever a factor of primary importance to the live stock grower and the new department of the 'International' will rank with the established features of the institution in commanding public interest."

"INTERNATIONAL" NEWS ITEM.

G. I. Christie, of Purdue University, Indiana, has been appointed Superintendent of the International Grain and Hay Show to be held in connection with the International Live Stock Exposition, November 29th to December 6th.

Prof. Christie has had a wide experience in public work and has been closely identified with the large agricultural movements of the country. He was appointed Assistant Secretary of the United States Department of Agriculture by President Wilson for the period of the war. He has been secretary of the Indiana Corn Growers' Association since 1906, and has conducted annually large and successful Corn Shows. He had charge of the Indiana agricultural exhibit at the Panama Exposition. Prof. Christie is acquainted with the leading grain and hay men of the country and will be able to enlist their co-operation and support for the International Grain and Hay Show.

A BIG REUNION

Twenty years ago when the inauguration of the International Live Stock Exposition summoned to Chicago live stock breeders and feeders from even the remote recesses of civilization, the leaders of the trade in an international sense, embraced the opportunity to create a new epoch.

During the intervening period many of these have passed from this sphere of usefulness, a new generation profiting by their public spiritedness and the seed they sowed has borne abundant fruit. The 1919 International affords an opportunity for a reunion of the survivors and a demonstration of how well they builded at a critical stage of the industry when public interest was revived in opportune manner.

Every man, woman and child enjoying the distinction of attending the 1900 International Live Stock Exposition should embrace the opportunity to participate in the Twentieth Anniversary of that event at Chicago during the first week in December.

The International Grain and Hay Show will be a center for educational exhibits.

RENOVATION OF CLOTHING FOR WINTER USE.

By Gladys M. Scott, '20.

THERE is a great need of practicing economy in clothing this season and one way of doing this is by restoring to good condition all clothing on hands. To do this requires:

1. Doing home cleaning.
2. Mending the garments.
3. Making over what cannot be otherwise used.
4. Dyeing the faded garments.
5. Taking proper care of the clothing.

The health, efficiency and good nature of an individual will be greatly improved by wearing clean comfortable and pleasing clothes. One of the secrets of being well dressed is the ability to keep all clothing clean and in good condition. Soiled garments may be entirely spoiled in the cleaning.

The materials commonly used for dry cleaning in the home are gasoline, ether, chloroform and benzene. Much care must be taken in the use of these for they are inflammable. They should never be used in a room with a burning lamp or a stove. Gasoline is more effective when it is heated by placing the container in hot water away from the stove. Putman's Dry Cleaner and benzene soap are good when used with gasoline. Apply the mixture to the garment, first on the spots, then immerse the garment in the gasoline, rub the garment lightly between the hands, then rinse in the fresh gasoline until the last rinse is almost clear. Set the gasoline aside to settle, drain it off and put into sealed cans for use on the next cleaning day.

Velvets are difficult to clean and freshen. The pile is worn off or is crushed. First, remove all dust by a careful brushing, then sponge the piece. The pile is interlaced, and steaming is necessary to raise it. Lay a wet cloth over the back of the velvet, lift the two pieces together and pass them over an inverted iron; or you may stretch the velvet over a kettle of steam or the steam from a tea kettle spout with the back of the velvet toward the steam.

(Continued on page 102)

THE PURDUE AGRICULTURIST

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural Journalism.

DOES FARM ADVERTISING PAY?

MANY farmers are often confronted with the question as to whether or not advertisements of their products pay. If they will think the matter over carefully and thoroughly, there can be but one answer to the query. Farming is becoming more and more highly specialized as the years go by. It is a business in which the corners have to be very carefully watched to get the right kind of returns. Other business organizations depend almost absolutely upon advertising of one sort or another to sell their products for them. Farm products of various kinds often sell at a loss because the man who would be willing to buy them does not know where they are to be found. Every farmer who has something better than his neighbors to sell, be it live stock or grain, will find that well placed advertising will pay for itself many times over.

HIGH PRICED LAND.

Never before has the country witnessed such a craze for purchasing high priced land as has existed during the past six months. In all probability the country has never witnessed such losses among farmers on land investments as it will witness within the next few months. Professional speculators have been in the land game the past season and they have made an enormous amount of money off

the farmer without giving him anything in return. Thousands of farmers have sold their farms at what seemed to be very high prices only to turn around and pay a much higher price before they were located again. Many dealers, both speculators and farmers, have been purchasing farms, making a very small deposit and then hoping to turn the property at a huge profit with little risk to themselves. Such methods can have but one result. Many farms after having been sold probably half a dozen times in one season and a very small deposit made each time will be left in the hands of their original owners, who will have nothing but their unpleasant experience to show for their dealings. Again thousands of farmers who are going in debt for high priced farms will undoubtedly have to clear off the larger part of their indebtedness in times of falling values, not only of land, but of all farm products. It is very evident that such a situation will cause a great amount of distress not only to the farmer himself but to other classes as well. It would seem to be a wise policy to be very careful about speculating in land and to be very sure that the buyer of your farm makes a heavy payment on his purchase.

FARMERS WAKE UP.

The rapid organization of Farm Bureaus throughout the State of Indiana,

in the recent drive, illustrates vividly, the trend of affairs agricultural. In times past the farmer has been prone to accept whatever condition existed and to make the best of it. Needless to say he was often imposed upon. But times have changed. Farmers are universally saying: "I'm for any organization that will secure for us a place at the tables of Big Business and in the councils of the government." As a result, they are coming into their own. The farmer is represented on the Industrial Commission, appointed by President Wilson, which would have been thought absurd a few years ago. But this is only the first step. The possibilities are unlimited. It is the privilege and duty of every farmer and college man to study better methods of procedure, along this line, in order that the tillers of the soil may in the future hold their rightful position of power in the country's affairs.

BOYS' CLUB CALVES BEAT THEIR FATHERS.

Boys in the Huntington County Pure-Bred Shorthorn Calf Club made a name for themselves and their work at the recent county fair by showing in open classes against their fathers or other breeders and winning first places in the only classes they could enter. Merry Isabelle 3rd, a Scotch topped heifer, who was bought by Hubert Smith for \$160 when the club was started a year ago, not only won first in the club contest, but also took first in the open class for two-year-old heifers. Young Smith won a trip to the International Livestock show, the gold medal given by the American Shorthorn Breeders' Association, \$10 from the District Shorthorn Breeders' Association, and \$5 for first in the open class.

Another club boy, Virgil Friedley, showed Lady Goldendrop, who took first in the junior yearling open class, besides second in the calf club show, County Agent Fred A. Loew reports. As a result of the calf club several new herds of Shorthorns have been started in the county and the grown-ups have realized they will have to step lively to keep ahead of the next generation of Shorthorn breeders who are just entering the game.

WATCH THE LITTLE THINGS.

It is the close observation of little things, which is the secret of success in business, in art, in science, and in every pursuit of life. Human knowledge is but an accumulation of small facts, made by successive generations of men, the little bits of knowledge and experience carefully treasured up by them growing at length into a mighty pyramid.

Life itself is made up of little things, all of which in the aggregate make up whatever is great. Moments are the golden sands of time. Every day is a little life; and one whole life but a day repeated. Springs are little things, but they are sources of large streams—a helm is a little thing but it governs the course of a ship. Nails and pegs are little things, but they hold parts of large buildings together—a word—a look—a frown, all are little things, but powerful for good or evil. Think of this and mind the little things.

As a result of the Bourbon Big Type Poland China Breeders' Association offering a choice gilt and \$25 in cash, twenty-eight boys were enrolled in the judging contest at the Bourbon fair this year, says County Agent V. V. Clarke.

FROM HERE AND THERE IN INDIANA.

Plans have been made for several new farmers' institutes in Washington County this year. Four were held last season and this number probably will be increased to ten this year, according to the county agent.

TRUSTEE BEAUTIFIES HIS SCHOOL GROUNDS.

The trustee of Elkhart Township, Noble County, has decided to beautify the school grounds of his township and has enlisted the support of County Agent B. V. Widney in some landscape work. This is being started at Wawaka, where the ground has been graded and suitable shrubbery is being set out. The ground is being prepared at two of the consolidated schools in the township and the same program will be used for all of them. The trustee will employ a custodian to keep the grounds up after the work has been well under way.

Apple Tree Borers

NEARLY 500 species of insects have been recorded as feeding on the apple. A very destructive kind among these is the Apple-tree Borer which, in itself, includes two widely different species of insects, namely, the *Saperda Candida*, commonly known as the Round Headed Apple-tree Borer and the *Chrysobothris Femorata*, or Flat Headed Apple-tree Borer.

For convenience in discussion it is best to consider these separately.

The Round Headed Apple-tree Borers are natives of America and rank among the most destructive enemies to apple and quince culture throughout the western and northern portions of the United States and also in Canada. They occur in restricted localities in the Southern States and wherever found their attack is not limited to the apple tree alone; other host plants are pear trees, crab-apples, mountain ash and most of the trees belonging to the family *Pomaceae*. Although present in most apple and quince orchards throughout infected territory the borer often occurs in injurious numbers in quite restricted localities. In some localities orchards have been ruined by this borer, while other orchards about two miles away owned and cared for by the same fruit-grower were not seriously infested.

The presence of this borer is usually detected at the base of the tree in the spring by little piles of sawdust—like castings thrown out from an opening through the bark into its burrows. Often several borers work in a tree causing the tree to have a weak and sickly appearance with leaves small and yellowish. Trees of all ages, from nursery stock to large orchard trees, are attacked and often killed. Rank vegetable growths of weeds, grass and water-sprouts around the trunks of the tree seem to afford more favorable conditions for this pest. For the most part the borers work in the base of the trunk often below the surface of the ground and in the large roots. Sometimes they infest the upper portion of the trunk and rarely the large limbs. The burrows begin in the bark or sap-

wood, but soon extend for several inches upward and downward in the solid wood, often reaching the heart of small trees.

The borer when full grown is a light yellow, legless fleshy grub about an inch in length with a dark brown head and blackish mandibles. The first thoracic segment is broader than the rest of the body. The constrictions of the first seven abdominal segments are roughened. The adult insect or parent of this borer is a handsome beetle measuring about an inch in length, the male beetle being considerably more slender and shorter than the female. The entire insect is covered with a velvet-like coating of fine, smoothly-laid hairs, giving it a very neat appearance. The head is a silvery white color, and from the white face of the beetle two broad, white stripes extend backward over the head across the thorax and along each wing cover to the tip. The general color of the wing-covers and dorsal portion of the thorax is light brown, and the blackish eyes are very conspicuous on the white head.

The round hole, nearly as large as a lead pencil in the base of the trunk of trees infested by this round-headed borer are the exit holes of the beetles which have developed from the grubs or borers. The beetles emerge mostly at night and remain hidden during the day. They emerge during the spring, and most of the eggs are laid in June. The smooth, pale, rust-brown eggs measure one-eighth inch in length by one-third as wide and are slightly compressed. They are laid in the bark usually near the ground. The female beetle first makes an incision in the bark, then deposits the egg in or near the broken surface and covers it with a gumming fluid, thus concealing the egg. The eggs generally hatch in about three weeks and the young larvae soon tunnel through the bark to the sapwood in which they work for a year or more often extending their burrows downward below the surface of the ground where they remain dormant during the winter. The borers begin work early the next spring and extend their tunnels into the solid wood. Most of the sawdust-like excre-



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ment of the grub is packed in its burrow but some may be pushed out through small holes eaten in the bark and it often accumulates in small piles at the base of the tree.

It is generally believed that it requires three years for this apple borer to complete its life-cycle. During the third summer the grub enlarges its tunnel and extends it outward to the bark. Behind itself the grub packs its tunnel full of sawdust-like excrement and similarly the end near the bark is often marked by a slightly sunken area of dead bark easily seen on small, smooth barked trees. A small chamber is left near the end of the tunnel in which the grub hibernates, and early in the third spring the borer sheds its skin and appears in the pupal stage, a delicate, yellowish white object, somewhat resembling the adult insect. In about three weeks this pupa transforms into the adult which soon emerges from the tunnel by cutting its way through the bark and is now ready to begin its cycle again by laying another brood of eggs.

Control of this insect is very difficult and as yet no thoroughly satisfactory method of preventing its ravages has been found, however, a few preventive or deterrent methods are of value in its control. One of the best known is tarred paper closely wrapped around the tree from the roots to a foot or more above the ground and well tied on, especially at the top. Alkaline washes of any kind of soap made into a thick paint with a solution of caustic potash or washing soda and about one pint of crude carbolic acid added to every ten gallons of the wash has been often used as deterrents with good results. Two or three applications should be made from early May to July, thoroughly covering the trunk from the branches to the roots. Some orchardists make a mound of earth from five to twelve inches high around the base of the trees in early spring, thus forcing the beetles to lay their eggs higher upon the trunk where the grubs can be more easily found and dug out. The mound should be removed in early autumn.

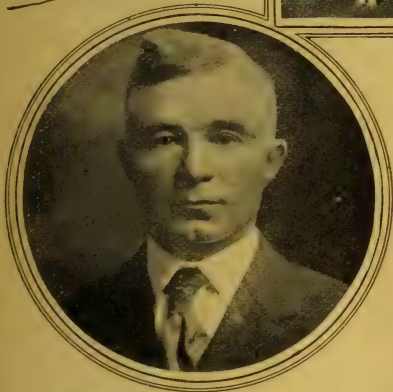
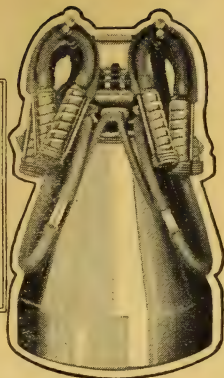
Clean culture is one of the best preventive measures. Do not allow rank

growths of weeds, water sprouts or other vegetation to accumulate about the base of the tree. After the borers are developed in the tree the best remedy for the pest is to dig them out. This is done by locating them as nearly as possible by the injury done to the tree and then by means of a sharp instrument cut away the wood and kill the grub. Any wound made upon the tree should be carefully coated with tar to exclude the moisture and prevent the development of fungous diseases.

The Flat-headed Borers differ from the Round-headed in that they are often found basking in the sunshine on fallen trees and the sunny side of the tree trunks, but the shy creatures are not easily captured, as they fly readily when approached. Their distribution throughout the United States and Canada is quite similar to the Round-headed Borers and their inroads are very similar, the same kinds of trees being attacked by each. However, their favorite natural host is the oak and their inroads are more destructive upon maple, hickory, chestnut, sycamore and willow than are those of the Round-headed Borers. While the Flat-headed Borer is more common, it is usually a less dangerous pest than the other species because it rarely attacks thrifty, healthy trees, but seems to prefer trees suffering from lack of cultivation, uncongenial soil, climatic or other disease producing conditions.

This destructive beetle is of flattish oblong form about half an inch in length, varying in size. The antennae are short, eyes large, and the front legs are armed with a conspicuous tooth. The upper surface of the body is of a dark, coppery-brown color, the under surface and the legs are of a bright metallic greenish hue. The males are smaller than the females and have shining green heads. These adults begin to appear in May and continue throughout the summer. The females deposit their eggs much the same as in the other species considered, however, the grub upon hatching burrows into the wood, generally rests in a curved position and gets its full growth in a single season. This legless grub is a light-yellow.

(Continued on page 100)



Mr. Akins Says The Perfection Milks More Gently

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PERFECTION MILKER

Essentials of Poultry House Construction

By John F. Morrison '21.

Although there are many types of poultry houses, yet each is for the same general purpose. The housing of the flock should be under conditions which will insure the largest returns on the investment. A house to fulfil this condition must be the one which approaches nearest the natural conditions, one which will protect the hen in times of unfavorable weather and make her comfortable. It must be a home to the hen. It is necessary that she be comfortable, protected, and well contented to insure her health and bodily vigor which means the highest egg production. So whatever the type of house, it must have these general characteristics: it must be dry, though not to dustiness, well ventilated, but with no draughts, have an abundance of sunlight, low cost, and durability.

A house to secure these advantages should be built where there is a well drained sandy loam soil. This will help towards dryness and dryness is necessary to sanitation, and disease prevention. The house should face the south with the windows so arranged as to secure the maximum amount of sunlight possible. Sunlight is absolutely necessary for the health and cheeriness of the hen. It has been said that a cheerful hen is the singing hen and the singing hen is a laying hen. The foundations should be built so as to exclude all moisture and dampness from the ground. The kind of foundation then depends on the type of floor to be used and the permanency of the house. The best and most economical floor for a permanent house is the concrete floor which will be perfectly dry when built over about a foot of gravel to break up capillarity and with a six inch foundation set two feet in the ground of concrete around it to prevent washing. If the wooden floor of a portable house is to be used it must be set about a foot off the ground for dryness and to prevent the rats from getting under it. But whatever floor is used it must be built large enough to allow a full four square feet of floor space per bird. The evils of over crowding cannot be over emphasized.

More disease in poultry is due to over crowding than any other one factor.

The walls on three sides should be air tight, to prevent draughts and thick enough to insure warmth in winter. As a sure measure and a cheap one they may be covered on the outside with tar paper. They should be built so as to give a good drainage pitch to the roof and plenty of overhead air space, without there being so much that the hens cannot keep the house warm. The front wall should have two glass and one screened window. The screened window should be provided with a muslin sash to cover the wire in inclement weather. But another thing that is of prime importance is that there be no draughts. It is the draughts that cause colds and croups. And both of these mean a falling off in egg production, so only the front of the house is left open so that there will be plenty of ventilation but no draughts.

The most economical roof is a shed type made of six by one inch siding, covered with tar paper. Another convenient roof for permanent houses is the half monitor type made of the same material.

The interior fixtures should all be arranged to allow the maximum amount of floor space for birds, efficiency in its use and convenience in handling and cleaning. One way is to make all fixtures portable and all two feet off the floor. For efficiency they are arranged along the back and side walls. The dropping boards and roosts, sometimes boxed in to prevent draughts, are put along the north side. The nests and feed hoppers are arranged along the east and west sides leaving nothing along the south side where the windows are.

For summer ventilation a small ventilating door may be hinged in between the rafters between the roof and the casing so that the draught from those doors will be over the heads of the birds. This is where it is preferable to have the roosts boxed in.

But whatever type of house is built it must have these essential characteristics, fresh air, dryness, sunlight, no draughts, low cost and durability.



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Alumni and Local

By G. A. Ross, '16.

IN spite of the rain, which fell in torrents nearly all day on Saturday, October 11th, which was the day set aside for the home-coming this fall, nearly 350 of the "old grads" returned to Purdue. If plans could have been carried out as originally intended, there is little question but that at least 400 or 500 alumni would have been back for the home-coming. Chicago, Indianapolis, Ft. Wayne and other associations had fully intended to send large delegations, but when Saturday morning dawned cold and rainy, many of the graduates living within automobile distance of LaFayette were forced to abandon the trip.

The original plan called for a mammoth all-university parade, which was scheduled for Saturday morning. It was proposed that the alumni, the Purdue band, university staff, and students, marching by classes, would be represented in this parade, and had this plan been carried out there is little question but

that at least 3,000 persons would have been in the line of march. However, the rain made it necessary to cancel the parade.

As the best substitute, a pep-fest was held in the Armory, commencing at about 11:30 o'clock Saturday morning. Nearly 900 alumni and members of the university community assembled for the festivities. The general program at the pep-fest was under the direction of the Alumni Association, G. A. Ross, '16, the newly appointed Alumni Executive Secretary, being in charge. Prominent features of the morning's program included talks by Dr. Stone, Dean Coulter, Director Kellogg (who is Mr. Cutts' successor), C. W. Morrey, '97, President of the Alumni Association, Dr. Moran and others.

One of the best features of this year's home-coming was the all-university luncheon which was held in the Armory on Saturday noon. Plans had been made to serve about 2,700 people at this luncheon, but owing to the rain less than one-half that number actually turned out. A regular luncheon had been prepared in advance, and it is estimated that about 400 alumni and former students were in attendance that day. Seats were provided for those who cared to enjoy a social hour, visiting old friends and forming new acquaintances. A splendid program was given by members of the Purdue band, who formed themselves into a real jazz orchestra.

The game with Illinois, which resulted in an Illini victory, 14 to 7, was all that could be desired in so far as Purdue's eleven was concerned. The men put up a fight that was worthy of any team, and if Scanlon's eleven had had a little more experience and a few more regulars to draw on, the score might have been different. Everyone who saw the game seemed well pleased, as both elevens played a fine article of ball.

Everything considered, this year's home-coming was a success in every sense of the word. True, if the weather man had carried out his part of the bargain and had greeted the alumni with

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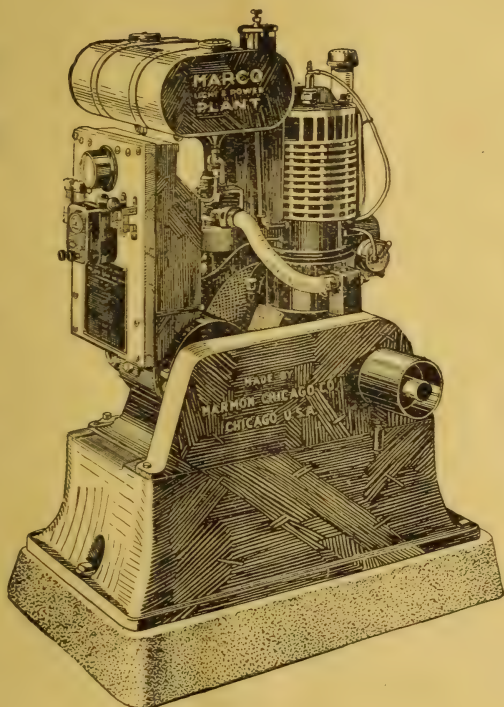
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pleasant weather, there is no question but that the alumni attendance would have been twice as large. However, under the circumstances, everything worked out all right, and those alumni who returned for the big times seemed well pleased with the program and festivities which had been arranged for them.

EXTENSION WORKERS' BANQUET.

A get-together banquet was held in the Agricultural building by the Extension Workers October 15. This proved to be one of the most successful banquets that has been held around the University in recent years. One very interesting feature was the explanation of the menu by the Home Economics Department. Each article was discussed separately, and the amount of ingredients and number of calories that each represented was brought out to show that the menu was a balanced ration.

Dr. W. E. Stone, president of the University, acted as toastmaster. Among those giving talks were W. T. McCray, Kentland; Dean Coulter, and Dr. T. F. Moran, the latter of whom choosing for his subject, Bolshevist and the Reactionary. The extensiveness of the affair may be shown by the fact that 220 plates were served.

The Fordson Tractor company has sent to Purdue one of its latest models of farm tractors. This tractor shows a sectional view of every moving part. The crankcase is cut away showing the camshaft and bearings. The new patent kerosine heater and water cooling de-

vices are clearly shown by this method. The bearings and gears on the rear axle are also shown.

54 PURDUE MEN HOLD COUNTY AGENT POSITIONS IN INDIANA.

Of the seventy-five county agents now holding office in Indiana forty-seven are Purdue graduates and seven are special students or short course men.

The following men representative of Purdue Agricultural College are holding county agent positions in Indiana:

H. R. Smalley '11, Allen county; C. M. Job '17, Bartholomew county; O. W. Mansfield '18, Blackford county; P. S. Lowe '17, Carroll county; W. K. Gast '17, Cass county; V. J. Mann '15, Clark county; H. E. Abbott '18, Clay county; D. D. Ball '17, Daviess county; C. C. Madison '17, Dearborn county; A. Z. Arehart '12, Dekalb county; H. C. Thompson '15, Dubois county; G. E. Metzger '14, Elkhart county; C. M. George '18, Fayette county; C. U. Watson '17, Floyd county; L. E. McKinzie '16, Fountain county; G. L. Reed '17, Franklin county; M. E. Cromer '14, Hancock county; R. E. Arnett '14, Hendricks county; Ralph Test, special, Henry county; A. E. Murphy '15, Jackson county; Stewart Leaming '12, Jasper county; Leroy Hoffman '18, Jay county; B. H. Doddridge '15, Jefferson county; W. R. Zechiel '11, Kosciusko county; C. A. Buechner '17, LaPorte county; James Kline, special, Lawrence county; H. S. Agster '15, Madison county; V. V. Clark '17, Marshall; H. E. Ackerson '17, Miami; B. V. Widney, special, Noble county; F. W. Frank '14, Orange county; W. E. Shrode '17, Posey county; R. S. Fouts '17, Putnam county; Calvin Griffith, special, Ripley county; R. G. East, special, Shelby county; P. G. Riley '17, Spencer county; P. G. Riley '17, Starke county; T. A. Parker '16, Steuben county; H. S. Benson '16, Sullivan county; Otis Crane, special, Tippecanoe county; R. D. Girard '14, Tipton county; M. A. Nye '18, Union county; R. N. Atkinson '17, Vanderburg county; H. S. Royce '17, Wabash county; R. E. Wilson '17, Washington county; E. C. Salisbury '04, Wells county; P. R. Bausman '15, White county; B. L. Hummel '17, Whitley county.

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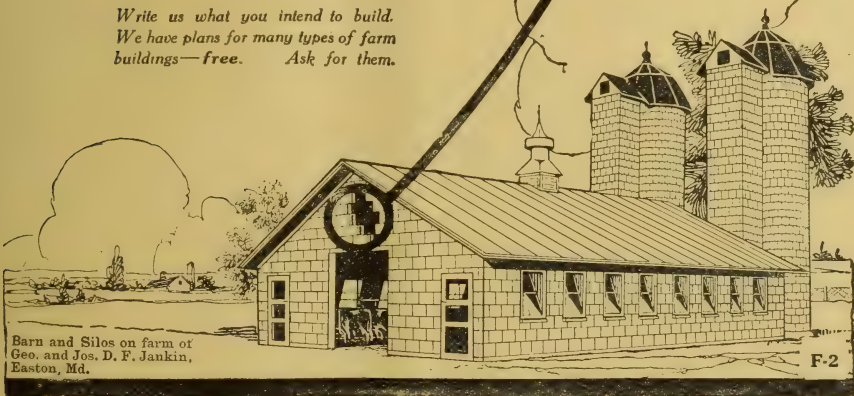
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IMPORTED GUERNSEYS AT PURDUE.

A foundation herd of pure bred Guernsey cattle has been established at Purdue. Professor O. E. Reed of the Dairy Department, has purchased six two-year old heifers from Charles L. Hill, importer and breeder of Guernsey cattle of Rosendale, Wisconsin. These heifers were imported into this country last May, and represent the best blood on the Island of Guernsey. Four of the heifers have freshened and are now on Advanced Register test. A young bull was also obtained from this same importation; he is an exceptionally well bred bull. His sire is out of the best known and most famous cow on the Island and his dam is a wonderful producer. She was imported this year for one of the largest breeders of Guernseys in this country. The names of the imported heifers are as follows:

Imp. La Marselaise of Corneilles, 94259,
Imp. Betty's Prize, 94246,
Imp. Lady Peer's Darling, 94275,
Imp. Jeanette of Seigneurie, 94269,
Imp. Ladyship II of St. Catherine, 94263,
Imp. Rosetta III of Annevilles, 94254.

"Piggy" Lambert, basketball, baseball and assistant football coach of Purdue, was elected president of the Western Intercollegiate Basketball Association at a meeting of that organization which was held at Chicago September 13. Lambert will succeed L. W. St. John, of Ohio State, and his election to this important position is looked upon with pride by his friends at this University.

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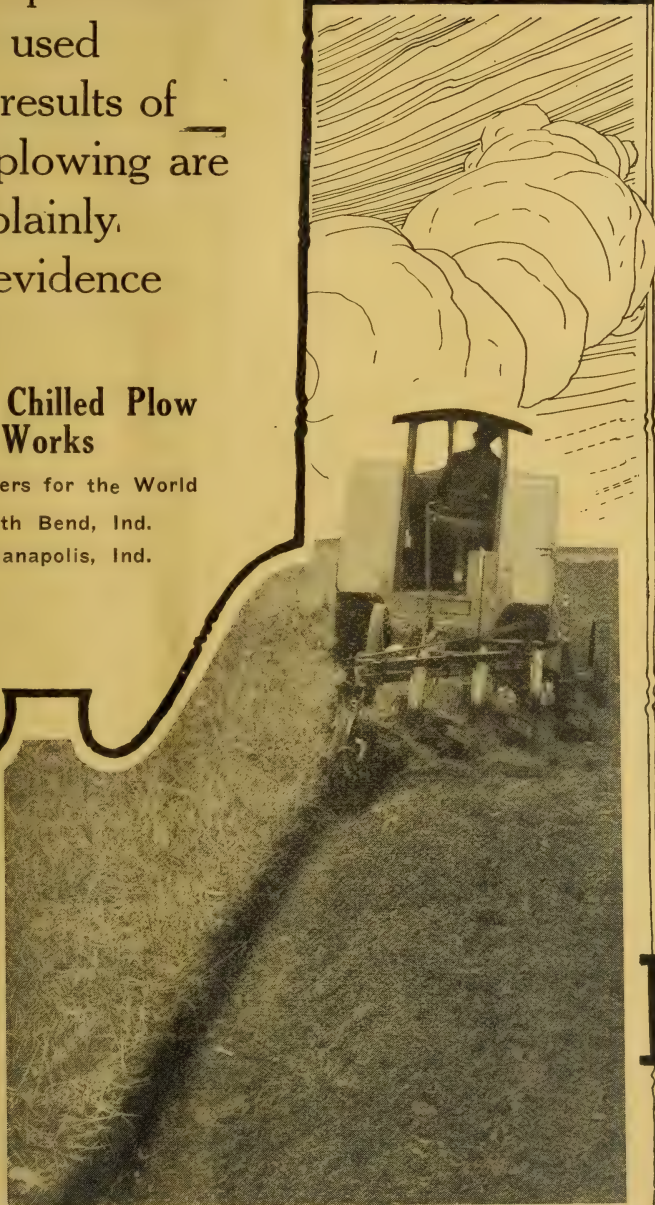
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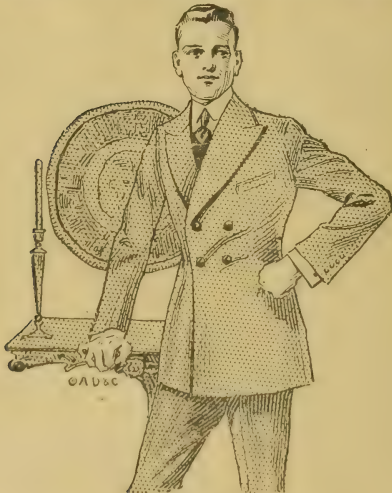
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WHAT ABOUT THE HONEY BEE.

The honey bee is too important for the farmer to leave out of consideration when he makes his many preparations for winter.

To afford protection and comfort to his domestic animals proper quarters and special advantages for feeding, resting, etc., are readily contributed.

The honey bee, however insignificant a creature it may be, is also worthy of attention. Little does the farmer realize that in the blustery days of January and February the life of the honey bee is determined by the atmosphere of the hive, the amount of honey available, and many other factors which may readily be corrected by giving the bees just a little of his time and attention.

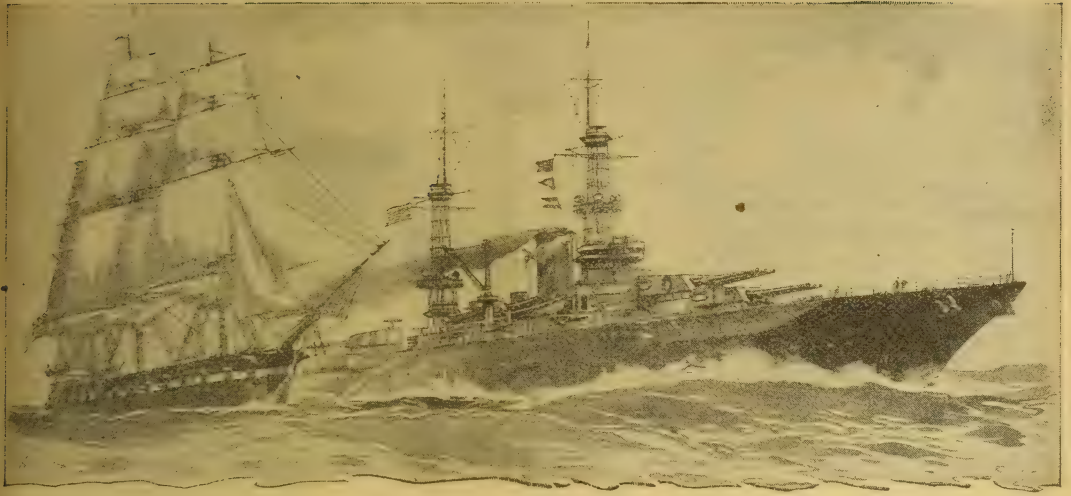
Right now is the time to prepare the bees for the winter by seeing that they have sufficient honey and by some method of packing give them the advantage of every comfort possible. This action will not only award the farmer a larger number of colonies to live through the winter but these colonies will also be stronger.

PROF. CHRISTIE TALKS TO AGRICUL- TURAL SOCIETY.

An interesting talk was recently given to the Agricultural Society by Prof. G. I. Christie, head of the Extension Department. Prof. Christie has recently returned from Washington, where he was engaged in government work.

Prof. Christie pointed out that the present high cost of living and the industrial unrest is due to the failure of the government to provide a definite reconstruction program and may not in any way be attributed to the prices which the farmer is receiving for his products. He quoted statistics to prove that the high prices the consumer is obliged to pay is due to the profit being made by the middleman and to the increased overhead expense of industries, caused by increased labor wages.

Prof. Christie predicted a greatly increased demand for foodstuffs and said that food prices would undoubtedly go still higher. He offered as a solution of food price problem, judgment in buying and conservation on the part of the housewife.



The "Constitution" of To-day—Electrically Propelled

THE U. S. S. "New Mexico," the first battleship of any nation to be electrically propelled, is one of the most important achievements of the scientific age. She not only develops the maximum power and, with electrical control, has greater flexibility of maneuver, which is a distinct naval advantage, but also gives greater economy. At 10 knots, her normal cruising speed, she will steam on less fuel than the best turbine-driven ship that preceded her.

The electric generating plant, totaling 28,000 horsepower, and the propulsion equipment of the great super-dreadnaught were built by the General Electric Company. Their operation has demonstrated the superiority of electric propulsion over old-time methods and a wider application of this principle in the merchant marine is fast making progress.

Figures that tell the Story of Achievement

Length—624 feet
Width—97 feet
Displacement—32,000 tons
Fuel capacity—a million gallons (fuel oil)
Power—28,000 electrical horsepower
Speed—21 knots

Six auxiliary General Electric Turbine-Generators of 400 horsepower each, supply power for nearly 500 motors, driving pumps, fans, shop machinery, and kitchen and laundry appliances, etc.

Utilizing electricity to propel ships at sea marks the advancement of another phase of the electrical industry in which the General Electric Company is the pioneer. Of equal importance has been its part in perfecting electric transportation on land, transforming the potential energy of waterfalls for use in electric motors, develop-

ing the possibilities of electric lighting and many other similar achievements.

As a result, so general are the applications of electricity to the needs of mankind that scarcely a home or individual today need be without the benefits of General Electric products and service.

An illustrated booklet describing the "New Mexico," entitled, "The Electric Ship," will be sent upon request. Address General Electric Company, Desk 44, Schenectady, New York.

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in
all large cities

95-108-1

HAYWOOD PUBLISHING COMPANY

LaFayette, Indiana

If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.

*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

2,628 STUDENTS ENROLL AT PURDUE.

The Agricultural students lead with a total of 567. The enrollment is as follows:

	Fresh.	Soph.	Jun.	Sen.	Spe.
Agriculture	251	112	89	93	22
Chem. Eng.	139	90	47	33	1
Civil Eng.	145	95	62	32	2
Elec. Eng.	236	119	66	37	2
Mech. Eng.	257	154	82	68	4
Four Year Phar. 3	3	2	4	—	—
Two Year Phar. 35	—	—	14	—	—
Science	129	82	56	51	11
Total	1195	655	404	332	42
Grand Total ..	2628				

George A. Ross, Purdue '16, has been chosen as a permanent secretary of the Purdue Alumni Association. This office has been newly created and Mr. Ross is now located in Lafayette.

"THE VESEY LAW"

(Continued from page 63)

uates, however, may apply for the life state license provided they have met requirements of professional training, character and fitness required for the provisional certificate and, in addition, have taught successfully at least fifty months.

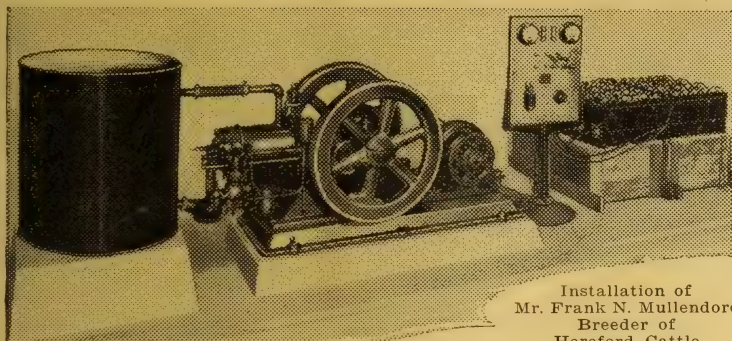
Graduates of 1919 classes should apply to their respective institutions for provisional certificates. Teachers in service who are graduates of approved courses and have had the required fifty months of successful experience, should secure application blank and make application to the state department for the life certificate.

CATTLE LICE AND THEIR ERADICATION.

(Continued from page 73)

mix well with hard water and can be used without injury to the animal. The nicotine dips also mix well with hard water. Coal tar creosote dips, while very effective, sometimes does injury when used with hard water.

From the above discussion it is evident that lice can be entirely exterminated.



Installation of
Mr. Frank N. Mullendore
Breeder of
Hereford Cattle
Franklin, Indiana

Investigate the Service that a **SWARTZ LIGHT PLANT** will give you

And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

A Word as to the Swartz Policy

From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

Send for Complete Information

There is a Swartz Electric Power and Light System of proper size and voltage to meet your individual requirements at minimum cost. Ask for your copy of the Swartz Catalogue.

Swartz Electric Company

Oldest Exclusive Makers.

General Offices and Works,
Speedway, Indianapolis

Indianapolis Branch,
5 N. Meridian St.

nated by exercising the proper care. There is no excuse for any farmer having cattle infected with lice. Feeds, housing, and labor are too high now to have anything but the best of live stock in prime condition for feeding. Each farmer should determine by careful examination of his cattle whether any lice are present. Early discovery of the parasites and prompt treatment will pay in increased and cheapened gains between now and spring.

APPLE-TREE BORERS.

(Continued from page 86)

low color about an inch in length with a large, flat head and very rough segments of the body. Pupation takes place within the burrow very similar to the pupation of the Round-headed Borer, and in about three weeks the adults appear, ready to start another life-cycle. Thus one year is required to complete the life-cycle of the Flat-headed Borer, whereas three years are necessary in the case of the Round-headed Borer.

As healthy, well established trees are rarely attacked by this borer, its ravages can be largely prevented by keeping the young trees in a thrifty growing condition. The deterrent soap and emulsion washes recommended for the Round-headed Barers are as effective in the prevention of attacks of the Flat-headed Borer, likewise the methods of digging them out is the same in each case. Thus if careful attention is paid to their prevention and they are carefully removed by digging out, if once established in a tree, the great loss due to their inroads can be prevented or at least greatly reduced.

THE FEDERAL FARM LOAN ACT.

(Continued from page 74)

ishes most of the funds loaned under the act.

While this act was passed only a little over three years ago, it is already on a substantial business foundation. Commissioner Norris, speaking for the federal board, says:

Reliable Heater Fountain

WARM WATER IN ZERO WEATHER

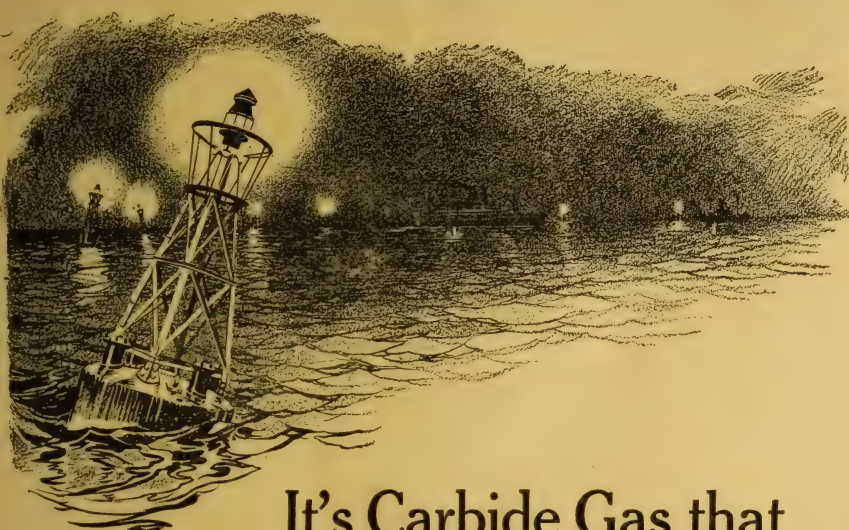
All feeders are agreed that plenty of fresh, warm water is essential to successful winter feeding of hogs.

Realizing this growing need we have equipped our famous **RELIABLE FOUNTAIN** with a lamp heater and are offering it to the trade under the same guarantee as our summer fountain. Made from very heavy gauge galvanized iron, has no valves or floats, nothing to get out of order.

Demand the best. Ask your dealer to get prices. Prompt delivery.

Crawfordsville Wire & Nail Co.

CRAWFORDSVILLE, IND.



It's Carbide Gas that Lights the Panama Canal

PRECIOUS millions of shipping pass through the Panama Canal. Every possible safeguard protects it. And the light that makes passage risk-free is Carbide Gas—simple, dependable, brilliant.

These same wonderful qualities have made Carbide Gas the lighting standard for over a quarter of a million country homes. They make their own gas from Union Carbide and water—use it to light their houses and barns, to cook their meals.

The story of Union Carbide reads like magic—the white magic of the brightest and softest light known.

We will gladly send you an interesting new booklet if you will say the word.

UNION CARBIDE SALES COMPANY

30 East 42nd Street, New York

Peoples Gas Building, Chicago

Kohl Building, San Francisco

A Higher Ideal

There would be no advantage in devoting the most valuable years of one's life to gain knowledge and experience, if greater possibilities and achievements were not forthcoming.

It is then proper to assume that because of his exceptional scientific training the agricultural college man is progressive, well advised in the most modern dairy practices and the methods that are likely to make dairying the most profitable.

You know that profitable dairy production cannot succeed without cleanliness, and you should also know that



is capable of maintaining a cleanliness that is productive of the highest quality dairy products, because it is used for thorough and sanitary cleaning by all Agricultural Colleges in the United States and Canada.

Ask your supply man to fill your order. It cleans clean.

Indian in
circle



in every
package.

THE J. B. FORD CO.,

Sole Mnfrs., Wyandotte, Mich.

"The August report is extremely gratifying to the board because it has brought the system to a mile post in its career, in that loans have been made to over one hundred thousand bona fide farmers and these loans now exceed a quarter of a billion dollars. The system is on a self-sustaining basis, and if we were to close our doors today we could, from the business on our books, pay all salaries, expenses and dividends for twenty years to come. For this reason, the board is recommending to congress that all appropriations by congress in connection with the management of the system shall cease, and that these expenses shall be borne by the system itself."

This act has already proved a stimulus to better farming, and has enabled many men of limited capital to enlarge their farming operations. More men should take advantage of this excellent method of securing capital.

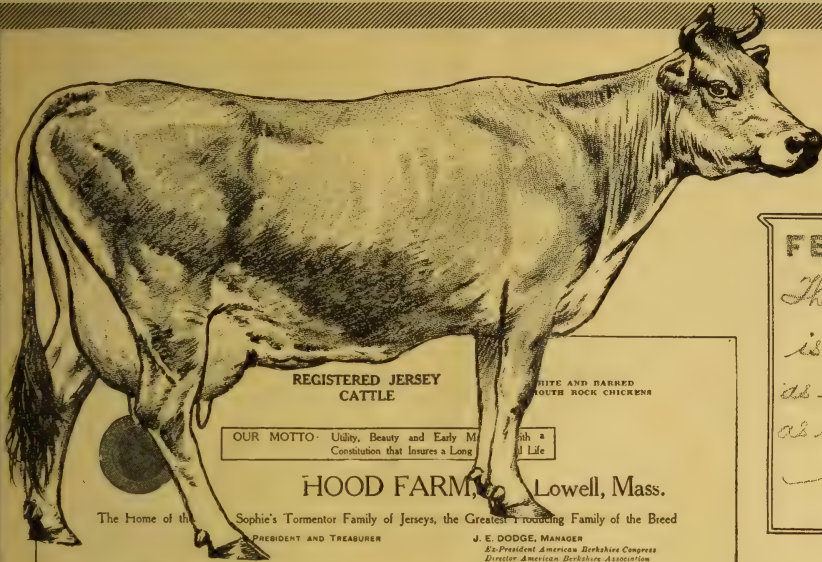
(Credit is due the "Experiment Station Record; col. 55" for data for this article.)

RENOVATION OF CLOTHING FOR WINTER USE.

(Continued from page 81)

Corduroy has been used a great deal for sport coats, baby coats and robes. Corduroy may be cleaned by washing in soap and water. Use a solution of mild soap, souse the garment up and down in the soapy water, changing it as it becomes soiled. Rinse and hang up dripping wet in such a manner that it is not stretched out of shape while drying. Dry in the wind if possible. When the garment is thoroughly dry, brush with a stiff brush to raise the nap.

Spots are very troublesome on clothing. The general method of removing a grease spot is to place a blotting paper or cotton cloth under the spot and apply some dissolving solution such as chloroform, then sponge it off with gasoline. Frequently rings will appear where the cleaning solution has extended over the spot. This may often be prevented by rubbing with an uneven stroke or by rubbing towards the centre of the spot. Paint spots are dissolved with chloroform or ether, and then brushed out with gasoline.



All prices quoted are subject to sale or
refuse without notice unless reserved.

JED-ESW.

May 6, 1919.

Mr. R. P. Walden,
Corn Products Refining Co.,
17 Battery Place,
New York, N. Y.

Dear Sir:-

Yours of May 2nd at hand. I would state that as usual in her former tests, Sophie 19th of Hood Farm consumed a large proportion of Buffalo Corn Gluten Feed, ranging from three to four pounds per day during the entire year. She is now at fifteen years of age in perfect physical condition and is due to calve in August, and we look for another large record from her, showing that the feed she has consumed in past years has done her no harm. It is safe to say she has consumed while making her eight yearly records over six tons of Gluten Feed.

Yours truly,
Hood Farm,

J. E. Dodge, Mgr.

FEED UP

*The Feeding
is every bit
as important
as the Breeding*



Made by

Corn Products Refining Co.
New York Chicago

...The... Zinn Store

is emphatically a

Store for Men

Absolutely no better or
safer place to buy

SHIRTS, NECKWARE,
HOSIERY, GLOVES,
UNDERWEAR.

Mending is something every thrifty housewife must do. A tear or worn place should be mended as soon as it appears, or at least it should be done before the garment is laundered for it prevents further wear and makes the patch less noticeable. Frequently it is a good plan to reinforce garments when the extra wear comes when making them for it will save a patch later.

Dyeing is becoming a saving for every home maker. Any garment that is sun-faded, streaked or dull may be made useful by careful dyeing. All the articles must be thoroughly cleaned before being dyed else poor results will be secured. Purchase a reliable dye. Wool and cotton require different kinds of dye. Follow the directions on the package very carefully. Always have enough liquid in the dye-bath to cover the garment entirely.

There are many possibilities along the line of making over garments and in those days when fashion lends itself to a charm in combination of colors and materials, the ingenious woman can remodel the old garments that she may find in the

Lefax Data Sheets

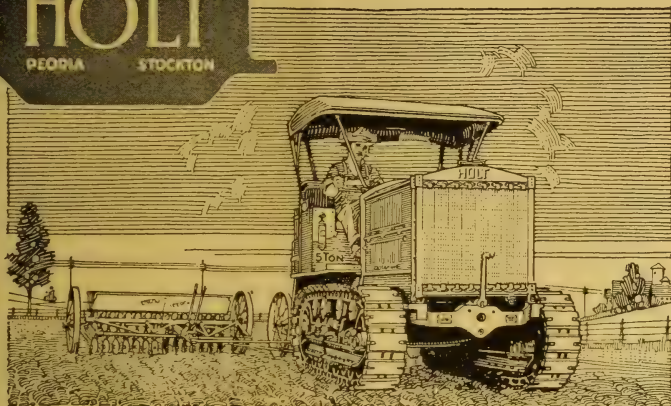
SPECIAL SETS

Air Gas Refrigeration
Architecture
Business
Chemical Analysis
Chemical Tables
Electricity A. C.
Electricity D. C.
Hydraulics
Machine Design
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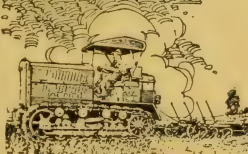
Metallurgy
Military
Mining
Motors and Generators
Power Plants and
Transmission Lines
Railway Construction
Reinforced Concrete
Steam
Surveying

COME IN AND LOOK IT OVER. NO CHARGES.

GABLER, The Student Store



The 5-Ton and 10-Ton "CATERPILLAR" Tractors were officially adopted, and designated in 1917 as "5-Ton and 10-Ton Artillery Tractors" by the Ordnance Department, U. S. Army.



"CATERPILLAR" TRACTORS

REG. U.S. PAT. OFF.

Every farmer knows that the better the seed bed is prepared, the nearer the right time the crop is planted, the bigger will be the crop yield. But many farmers do not yet know that the "Caterpillar" is the one tractor that puts such work **always** within their power.

In the great world war the "Caterpillar" demonstrated its dependable power and endurance. On the farm you can drive it day and night if you wish—you can plow any field as deep as you want to, whenever you are ready and faster than you ever plowed before.

These "Caterpillar" Tractors are the models used by the U. S. and Allied governments. Their great strength, power and stamina, built for war's emergency, are ready now to work for you.

The 5-Ton model develops 3,100 pounds draw bar pull at a plowing speed of 3

miles per hour and easily draws four 14 inch plows at a plowing depth of 8 to 10 inches. Carries and lays its own track. Turns in its own length. Three speeds and reverse. Travels faster than 5 miles per hour on the road. Mud, soft soil or sand can not stop it. That's the kind of tractor every good farmer wants.

Get complete information about the "Caterpillar." Write Today -

The HOLT Manufacturing Co., Inc.

There is but one "CATERPILLAR" - HOLT builds it.

Peoria, Illinois.

Factories: Peoria, Ill. and Stockton, Cal.

Branches and Distributors:

Atlanta, Ga.
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Wichita, Kans.
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MURPHEY-BIVINS CO.
PRINTERS
LA FAYETTE, IND.



Letter Heads, Office Supplies
 Social Stationery
 Visiting Cards
 Announcements
 Invitations
 Programs a Specialty

**STOCK SALE CATALOGS A
 SPECIALTY.**

old trunks or the closets. It requires serious thinking and planning, perhaps the spending of some money, but the garment, if well made will be worth while. But before beginning the making over of a garment it is well to ask oneself:

(1) Is it worth making over?

(2) It is necessary to rip the garment to pieces, or can I use some of the old seams as they are?

(3) Shall I add any expense to the dress by buying trimmings, etc.?

(4) Do I really need the garment or do I have the "make over craze"?

Study the magazines and find designs that require two different kinds of material as those designs are easier to use for make-over garments. Perhaps the father's overcoat is worn shabby in places, but here will be plenty of material to make the little boy a coat; or a dress may be made for the little girl from an old dress of the mother's.

Suits are perhaps the most interesting make-over problem. Splendid coat dresses are made from suits after the linings are removed, and a collar and

"MADE IN INDIANA"

Kingan's Digester Tankage

(HOG FOOD)

Manufactured in accordance with the Indiana Feeding Stuffs Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining "KINGAN'S" Digester Tankage of your dealer.

KINGAN & CO. LTD.

**BEEF AND PORK PACKERS,
 INDIANAPOLIS, IND.**

Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

ACME-EVANS COMPANY

Indiana's Largest Millers

INDIANAPOLIS, IND.

HANSEN'S Dairy Preparations

For cheese and butter making on the farm as well as in largest creameries and cheese factories, Hansen's preparations are standard. They are **pure, concentrated, and simple to use.**

Use Hansen's Rennet Tablets, Rennet Extract or Lactic Ferment Culture for cheese making (in the small dairy Junket Brand Buttermilk Tablets are used to advantage for cheese making).

Hansen's Danish Butter Color, and Hansen's Cheese Color are used in the finest creameries and cheese factories. Hansen's products are on sale at drug or dairy supply stores or sent direct.

"The Story of Cheese Making" by J. B. Frederiksen, free on request.

Chr. Hansen's Laboratory, Inc.

Little Falls, N. Y.

cuff set are added, or perhaps a bit of wool embroidery or braiding.

To be careful of clothes which are in every day use is one of the truest economics that girls can learn. When hanging up clothing it should be brushed, shaken and reshaken.

Some points in proper care are:

1. Hang up the clothing so they will not become wrinkled.
2. Sponge and press woolen garments.
3. Keep all buttons, hooks and eyes carefully sewed on.
4. When the skirt belting or band wears out, replace with a new one.
5. Put new ruffles or facings on petticoats.
6. Darn your stockings.
7. Keep shoes repaired and polished.
8. Keep gloves clean, place away neatly in a box when not in use.
9. Keep hats well brushed.
10. Always keep coats on hangers.

If you want to be well informed, take a paper; even a paper of pins will give you some points.

AGRICULTURAL LIMESTONE



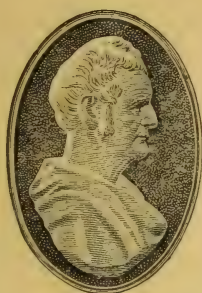
WRITE FOR SAMPLE AND PRICE

A. & C. Stone and Lime Co.

GREENCASTLE, INDIANA.

RIDGEVILLE, INDIANA

General Office
INDIANAPOLIS, INDIANA.



JOHN DEERE

He Gave the World the
Steel Plow

Be a Business Farmer

Your school has earned fame because of the great aid that it has given in making farming a better business.

You are in school to equip yourself to make farming a better business.

When you leave to begin the active work of farming you can do full credit to your school and to yourself only by being a good business farmer right from the start.

That's when you and John Deere implements will be on common ground.

These implements are continually going out from the sixteen John Deere factories to help make farming a better business.

For 80 years they have been the choice of the majority of good business farmers—of men who want the best implements they can get.

You will find John Deere implements and machines ready for you—for practically every farming operation.

And every one of them will do the utmost to help you make good with your plans for making farming what it ought always to be—the best business in the world.

John Deere, Moline, Illinois



The Wiser Way To Increase Dairy Profits

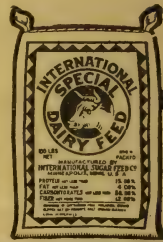
Wise dairymen have discovered that the way to increase profits is to get more milk without increasing the production cost. This method is made easier than any other by International Special Dairy Feed.

This great ration is efficiency applied to feeding. It is designed to make more milk. Has just the proper elements in the correct proportion. It cannot fail. Yet it costs no more than any other feed. In fact it will cost less than a whole grain feed besides giving you a profit from selling the grain. Order a ton for trial. Apply to the mills if your dealer cannot supply you immediately.

International Sugar Feed Co.
Minneapolis - - - Minnesota

INTERNATIONAL

Special Dairy Feed



Over Forty One Million Dollars!

An enormous sum
—and yet,
large as it is—

We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the **SEVEN** largest Live Stock Commission Houses on the Chicago Market and we are also one of the **SEVEN** largest Houses on the Kansas City market.

We sell the experimental and fat cattle for the Animal Husbandry Department of Purdue University, Illinois State University and the Missouri State University and also the Experimental cattle from Worcester, Ohio.

LET US HANDLE YOUR NEXT SHIPMENT

Alexander Conover & Martin

LIVE STOCK COMMISSION

U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

DAIRYMENS' BULLETIN BOARD

FEED ENOUGH

Two Words That Spell PROFIT For Dairymen

Do you know that 90% of the dairy cows of America are underfed?
Do you know that nine out of every ten dairy cows would be BETTER producers if they were fed the proper ration to the limit of their capacity? Try this experiment and see for yourself the increased milk production you will get—begin feeding

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

to your milking herd, two parts Schumacher and one part Big "Q," in the same amount you usually feed, together with ensilage or other roughage. After three or four days, begin increasing the amount 1 pound per cow at each feeding and keep increasing as long as each cow increases her milk production, until she has reached her maximum flow. Some of your cows will handle more feed than others. Watch the results on each individual cow and feed each cow to the limit—the increased milk production will repay you many times the cost of the additional feed. Mr. Fred Lehman, of Carlisle, Pa., proved that maximum feeding increased his profits \$25.30 during April from 4 cows.

SCHUMACHER FEED and BIG "Q" Dairy Ration fed in combination will solve your feeding problem, and if fed as directed will insure maximum production and profits.

These feeds make feeding easy, economical and accurate. SCHUMACHER FEED (the carbohydrate ration) and BIG "Q" (the high quality protein ration) have unusual palatability, high digestibility and nutrition. Thirty-five World's Champion Dairy Cows have made their World's Records with these feeds—undeniable proof that they are the greatest dairy feeds in the world. Your dealer can supply you.

Write for FREE Folder, "Long Time Milk Production and How to Get it"—also tells how to feed dairy cows during entire lactation periods for best results.

The Quaker Oats Company

Address: CHICAGO, U. S. A.



I wish to thank

Agricultural Students of Purdue University for their past and future patronage.

"Deac"

H. G. REISNER,
Student Supply Store.

Carson's Drug Store

KODAK FILMS
DRUGS AND
SCHOOL SUPPLIES

306 State St., West LaFayette



Kodaks Eastman Film Quality Finishing

Conducted by a Purdue Man for
the Satisfaction of Other Purdue
Men.

The Foster Shops

Opposite the Campus,
West Lafayette.
West Side Square, Lafayette

College Footwear

of all descriptions
for all occasions

—FOR—

Co-Eds
Students and
Faculty

The Varsity Boot Shop

302 State St. West LaFayette

Jaques & Southworth Company

STUDENTS'
DEPARTMENT STORE
308-10 State Street

WE CAN SAVE YOU MONEY ON
BOOKS

Big Stock of Second Hand and
Slightly Used Books

DRAWING INSTRUMENTS and
all STUDENTS' SUPPLIES

Gents' Furnishing Goods,
Confectionery and Cigars

SPECIAL FOUNTAIN SERVICE.

Deposit your Money with Us—
No Charge.

Ag. Sem

THE PURDUE AGRICULTURIST



DECEMBER, 1919



VOL. 14

No. 3

Results!

The Cost per pound
of pork produced
shows true economy
in feeding

25% to 40% more live hog
than from other feeds at same
cost per pound of pork pro-
duction—250 to 280 pound
hogs at six months old—these
are results being secured by
users of

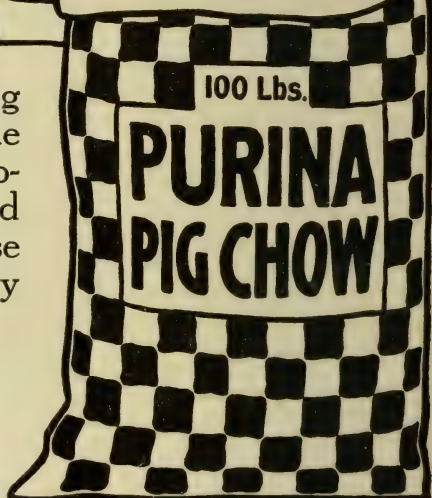
Purina Pig Chow

Such results are possible only be-
cause Purina Pig Chow is scientifi-
cally mixed to include the right
proportions of food elements for quick
growth of bone and flesh and for fatten-
ing. It fattens while the pigs grow,
thereby putting them on the market
fully thirty days earlier than other feeds.
Put it to the test. Ask for our Hog and
Steer Book. See your dealer. If he
can't supply you, write

Purina Mills

St. Louis, Mo. Buffalo, N. Y.

Sold in checkerboard bags only



**Don't take chances
on losing your pigs!**

**TREAT YOUR PIGS NOW—
USE THE BEST**

Serum and Virus

The Single Bled from the Swine Breeders Pure Serum Company saves your hogs. Experience has proven it to be **the best**. We can supply your wants at once.

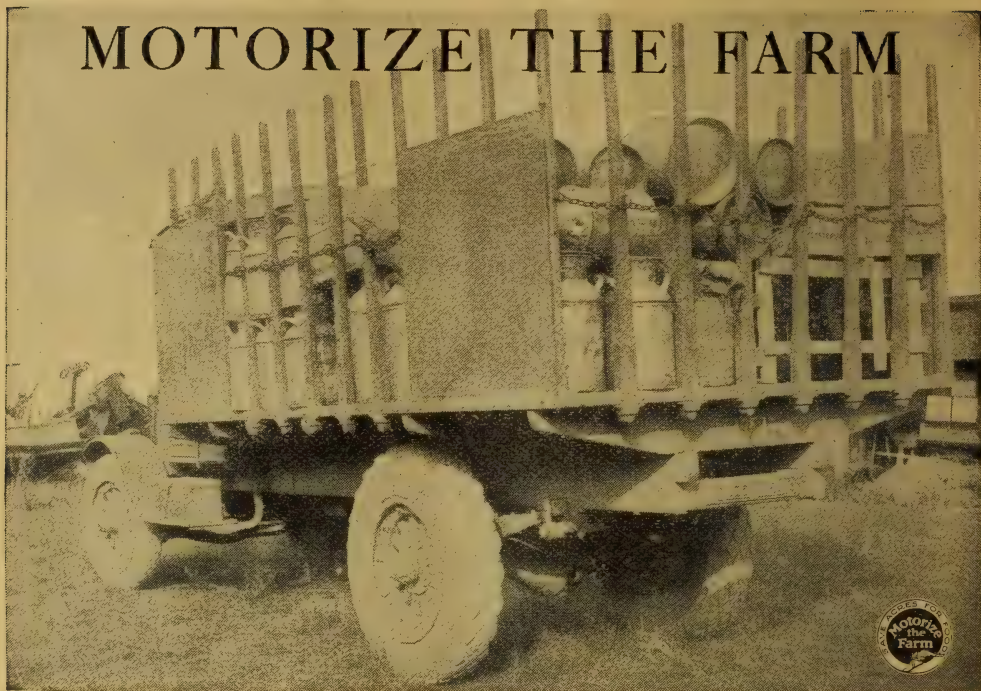
Prompt attention given to all orders.

Don't wait until you get disease in your herd. Save trouble and loss by treating your pigs now while they are well. Write.

**Swine Breeders Pure
Serum Company**

THORNTOWN, INDIANA

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The diverse type of Indiana soils makes a soil survey of very great value to Indiana farmers.

THE PURDUE AGRICULTURIST

VOLUME XIV

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Something of the Value of Soil Surveys to the Practical Farmers

Prof. O. H. Sears.

THE most important material problem of the United States is to maintain the fertility of the soil. Success or failure in agriculture is largely dependent on the crop producing power of the soil. A knowledge of this important asset is therefore a necessary prerequisite for the best results in any system of farming.

The great variation in the agricultural value of soils, their tillage and fertilizer requirements and crop adaptability has lead to many attempts to divide the land into areas of the same general character. Soils formed by the same agencies from similar kinds of material have been found to correspond very well in their crop producing abilities and since crop production is the most important function of the soil it would seem logical to classify them on this basis. The Bureau of Soils of the United States Department of Agriculture has made this the basis of differentiating soils and from it developed a system of classification in which the following factors are considered: (1) Texture or the size of the individual soil particles, (2) Kind of material from which the soil was derived, which includes the various kinds of minerals and rocks, (3) Agency of formation, as glaciers, streams, lakes, etc., (4) Special properties among which are, color, drainage, topography, lime content, (5) Rainfall, (6) Temperature. The last two of these are usually so uniform in a given area that they are given consideration but once while the others very frequently show great variation.

Soils which are similar in all of these properties except the first are placed in a group known as a series and are given a "series name" as Miami soils. The texture, which exerts more influence on the plant than perhaps any other property, is given a "class name" as silt loam,

fine sandy loam. The soil "type" is the unit for classification and is indicated by prefixing the series name to the class name as Miami silt loam.

The soil survey consists of classifying and mapping the soils of a given area. In Indiana the county is taken as a unit, the area is gone over and the boundaries of the different soil types are traced and shown on maps. Where topographic surveys have been made by the United States Geologic Survey they are used as base maps, but where these are not available it is necessary to make a plane-table traverse survey locating the roads, streams and houses as well as the boundaries of the soil types. These detail maps are made on a scale of one mile to the inch and are of sufficient accuracy for use for any purposes requiring exact locations even to routing armies in times of war.

The report of the soil survey consists of an engraved map and a description of the area. In describing an area the report gives the location and boundary, the general physical characteristics including the topography, natural drainage, etc., the general agricultural conditions such as the general type and methods of farming, the rotations practiced and the kinds and amounts of fertilizers used. Reference is also made to the size of farm and value of farm lands. A detailed description of the individual soil types discusses their origin, mode of formation, general characteristics and distribution. Suggestions for improvement in the management of the soil based on experimental data obtained on similar types of soil are often included.

The soil survey obtains information of considerable value to several classes of people. The farmer can see the character and location of the several types of

soil on his farm and by referring to investigations determining what methods have been most profitable on land similar to his own. The reports serve as a guide for land investors not only among the farmers, but also for bankers and real estate men. Insurance companies obtain valuable knowledge relative to fixing premiums on crop insurance and to the scientist needs for further investigation are suggested. Descriptions of soils are simplified, standardized and made intelligible and the field of usefulness of knowledge previously obtained is broadened.

The Bureau of Soils did the first classifying and mapping of soils in 1899, and at the end of the year 1914 had mapped more than one hundred and twenty million acres, employing at that time from fifty-five to sixty men. The work is so arranged that the men work in the northern states during the summer and go south during the winter. Besides the men employed by the Bureau of Soils, many of the states are co-operating in the work in the state and furnish the same number of men as are sent by the Bureau.

Previous to 1919 twenty-eight counties had been surveyed in Indiana. The first

ten of these were mapped entirely by the Bureau of Soils while in the others the Indiana Department of Geology co-operated. Beginning this year the Soils and Crops Department of the State Agricultural Experiment Station are co-operating in this work. Four men have been in the field since May and have classified and mapped the soils of one entire county, Decatur, and have finished an incomplete survey of Adams county. In addition to the report which the Bureau of Soils will make on these counties, the Station will publish a report containing the same general information along with the chemical analyses of the various soil types and experimental data obtained on fields of similar kinds.

Inasmuch as the soil survey furnishes such a large amount of valuable information relative to the needs as well as the possibilities of our soils, a national system of agriculture built on the soil survey would insure for us the best utilization of the several hundred types of soil in the United States and prevent the complete exhaustion of the fertility of our soils.

The Agricultural College Graduate

THE question has often been raised as to extent the agricultural college graduates follow their line of training upon graduation and in no few cases has this been taken as a measure of success of those institutions.

The reason for raising the question is due to the fact that there are still some who are skeptical about agricultural courses. These critics take for examples, as a general rule for all, those few who do not take up positions in accordance with their training. Why they do not notice those that are making use of their schooling, as by far the greater per cent do, no one knows. A typical criticism which was overheard some time ago and investigated, is as follows: "There were twenty students that entered Purdue University during the last twenty years and there is but one of them on the farm now." Upon investigation of this particular community, it was found that twen-

ty-seven students had entered Purdue in the last twenty years. Out of these, eleven enrolled in Science, three in mechanical engineering, two in civil engineering, two in electrical engineering, four in pharmacy and five in agriculture. Two of the five enrolled in agriculture died before completing their courses, one dropped out before graduating, leaving only two out of the five who entered as agricultural students to graduate and they are on the farm now.

How many of the science, pharmacy and engineering students are following their particular line of work we are not so much interested in. It is hardly expected that one who comes to school and takes up an engineering course will take up agriculture upon graduation.

Due to the Experiment Stations and Extension Departments connected with all the land grant colleges throughout the country, we are able to get figures on

the number of men in certain institutions, that have taken the agricultural courses, and the per cent of these engaged in agricultural work after graduation. Michigan Agricultural College, the oldest college in the United States teaching agriculture, published a bulletin some time ago in which it stated that 996 men graduated from the regular four year course in agriculture during the first fifty years and that 877 were living in 1912. It is not very surprising to see that quite a number of these men took up positions at that

number of graduates from Michigan Agricultural College who are actual farmers is 32 per cent for the ten years 1901-1910, as compared with 27 per cent for the first fifty years.

Another example is, that from 184 graduates from Illinois University, 115 are actually farming, 40 are connected with experiment stations and extension departments, seven are with the U. S. Department of Agriculture and one is editor-in-chief of an agricultural paper, making a total of 161 out of 184 or about 90 per



The field for the agricultural graduate is widening. More than 1100 are needed annually to supply the vacancies in the field of agricultural education.

time not relating to agriculture when you consider the fact that the study of agriculture has not been seriously considered as one of the scientific studies and professions until recent years. Nevertheless, over 27 per cent of these men that graduated from the Michigan four year course are farmers, nine per cent are connected with Agricultural colleges and experiment stations, five per cent in the U. S. Department of Agriculture and twenty per cent in agricultural lines such as, teaching, forestry, seed growing, veterinary, etc., making a total of 61 per cent engaged in agricultural lines. If we consider more recent figures of the same institution, we find that out of the classes graduating from 1901-1905 inclusive, 72 per cent are engaged in agricultural lines and those graduating from 1906-1910 inclusive are 86 per cent, making an average of 79.5 per cent for the ten years just mentioned. The total

cent that are following agricultural pursuits.

It is reported that out of 189 graduates from the Agricultural College of Iowa who are engaged in agricultural lines 132, or about 70 per cent are farmers. It has also been noted that out of 1,582 persons that have taken the short course at North Dakota Agricultural College during the five years previous to 1912 more than 90 per cent are employed on the farm.

Bringing this matter nearer home, let us consider the data available for Indiana up to 1917. There were four hundred and thirty-two men that graduated from 1882 to 1915 inclusive. Ten of these died before graduating. Of the remaining four hundred and twenty-two, one hundred and ninety or 45 per cent are engaged in agricultural lines, two hundred and three or 48 per cent are engaged in farming, making an average of 93.1 per cent engaged in agricultural pursuits.

What has been said of the above colleges holds true for all the agricultural colleges in the country. Considering other countries we find that if we take the figures for Great Britain from the report of the Board of Agriculture and Fisheries on the Distribution of Grants of Agricultural Education and research in 1910-11, we learn that out of 1,769 students that took an agricultural course, 1,447 became farmers and 184 land owners. In other words there were 1,631 out of 1,769 entered occupations relating to

against insects and other pests that were destructive to the farmers' crops and live stock of former years. They realize that the Experiment Stations and Extension Departments are responsible to a great extent for the scientific knowledge disseminated to the farmers and that they will continue to do so in the future. This is proven by the fact that seventy-five counties out of ninety-two in the state of Indiana have county agents. (Forty-seven of these are Purdue graduates.) There are two thousand seven hundred



First hand information from the agricultural graduate. The supply is not equal to the demand.

agriculture or a total of more than 92 per cent.

The above figures clearly show that by far a greater percentage of the agricultural college graduates of recent years are taking up positions in harmony with their college training. What is more noteworthy is the fact that a greater percentage of these are returning to the farm. This undoubtedly is due to several reasons. Chief among them all is that American farmers are awakening to the fact that the population of the United States is increasing more rapidly than the farms and they know that if America is to feed its millions as well as the millions abroad, they must use scientific methods in the production of foodstuffs, in the management of the farm and in the fight

and seventy-four county agents in two thousand three counties out of a total of two thousand nine hundred and fifty in the United States. What clearer evidence could be obtained to show that these departments are doing their utmost in teaching the farmer the value of scientific training?

Now the question may be raised, "Will these conditions continue in the future?" or "What is the outlook for the Agricultural college graduate in the future?" The outlook is most optimistic. The experiment stations and extension departments are here to stay. Instead of decreasing the number of employees they will increase them as needed. Taking figures published by the U. S. department of agriculture, there were 4,485 persons

engaged in scientific research work, teaching agriculture and in experiment stations during the year ending June 30, 1917. Taking ten years as the average of these offices, there would be 448 persons needed each year to fill these vacancies.

Again, the same report says that there were approximately 16,000 persons employed in the United States Department of Agriculture during the same year, not including the 4,485 mentioned above. About 2,100 of these are on the scientific staff and without a doubt hundreds of others out of the remaining 14,000 are college graduates doing work as assistants. Figuring the same tenure of years, this department would need 200 men each year to fill its vacancies. There are 2,950 counties in the U. S. and the Smith-Lever act is to eventually place a county agent in each of these counties. The total number employed in extension work up to January 1, 1919, was 4,998 persons of whom there were two thousand seven hundred and seventy-four county agents in 2,300 counties, 1,679 women home demonstrators and 445 boys' and girls' club workers.

Looking at the above figures it is easily seen that the number of trained men and women needed as county agents and

home demonstrators is very large. A fair estimate of these would be from 350 to 500 each year.

Another field open is the teaching of agriculture in vocational schools. These schools are just being established and the field open to teaching is very large. There were 2,500 men and 400 women engaged in teaching of agriculture in such schools according to the U. S. Commissioners' report for 1916. Due to the fact that many of these schools are being added to the list each year, it is a very conservative estimate to say that at least 300 to 500 are needed annually to fill the positions in vocational teaching.

The large manufacturing concerns connected with the farmers, directly or indirectly, such as the fertilizer companies, the manufacturing of agricultural machinery, the creameries, etc., are employing agricultural college graduates. This only goes to show that the field for the agricultural college graduate is widening and has a most optimistic future.

Taking the total number of men needed to fill the vacancies of all the above mentioned positions, it is a fair estimate to say that at least 1,100 are needed annually and with very few exceptions must be agricultural college graduates.

Resolutions Adopted by American Farm Bureau Federation at Its Organization Meeting

November 14, 1919.

1. We declare our independence of affiliation with any commercial, labor or industrial organization, but maintain a co-operative attitude toward all movements promoting the welfare of American Institutions.

2. We appreciate the work of the press, both agricultural and secular in its promotion of high ideals and constructive thought.

3. We unqualifiedly assert our loyalty to the principles of the freedom of the people under our American institutions, and while recognizing the right of any and every class of our people to associate themselves for material benefit, we just as strongly assert the right of every American citizen to the free and unhampered privilege of disposing of his labor

or products thereof as he may individually desire.

4. We desire to point out that a large factor in the high cost of living is the curtailing of production through shorter hours, lessened efficiency of labor, and strikes.

5. We approve the Federal Land Banks and request that the maximum individual loan be changed from \$10,000 to \$25,000.

6. We recognize that land ownership is stewardship, that ownership does not give the right to soil depletion and we deplore the system of tenantry that encourages a rapid reduction of soil fertility.

7. We recognize our great obligation to the returned soldiers and sailors and recommend the appointment of a commit-

tee of three of our Board of Directors to act with the American Legion in devising means of getting returned soldiers reinstated into civil life.

We extend to our soldiers of lands, seas and air, men and women, fresh from the battle fields and hospitals of Europe, our admiration and our love. These young men and young women, sons and daughters of ours—who, one year ago were in the camps at home and abroad, serving, suffering and dying—that civilization might not perish from the earth, are worthy of all boundless gratitude, praise, and no gift of the people is too good for them. We believe a constant effort should be kept up to help place them again among us, in society and business. We welcome them to the farms and we will do what we can to help them begin life over as farmers, if they choose to do so.

We commend them "for organizing the American Legion." We see in it what we have seen in the "Grand Army of the Republic" and the United Confederate Veterans-Citizen soldiers for law and order, and a guarantee that civil and religious liberty shall be maintained in this land at all costs.

8. This organization recognizes that the strength and origin of the American Federation of Farm Bureaus has been achieved through co-operation with the State and Federal Department of Agriculture, upon a sound educational program of local work.

We declare it to be our purpose to continue such co-operation in the future and that neither business enterprise nor legislative activity should diminish such co-operative, educational activities.

9. We urge the strengthening of the county organization financially and otherwise, so that capable men may be employed to manage the work of the county organization.

10. When State or Federal Government grants cooperate rights to any organization it is incumbent on that government to protect the public through such regulating legislation as will best prevent favoritism, stimulate initiative and guarantee adequate public service.

11. We urge that as rapidly as possible all corporations doing interstate busi-

ness to be under Federal Charter and all other corporations to be incorporated under the laws of the state in which their principal business is located.

12. We are opposed to government ownership of public utilities. We demand the early return of the railroads to private control, under such conditions and regulations as will render adequate service at just and equitable rates. We particularly demand immediate attention to restoring the efficiency of live stock and other perishable transportation, both in car equipment and train schedules.

13. Recognizing the economic law that impels the consolidation of business we proclaim that relief from the extortion of monopoly in manufacture and commerce is to be found in co-operation, in enforced publicity of business records, and a just graduated income tax rather than through interference with the economic law upon which great industries are founded.

14. We recommend such regulation of all purveyors of foodstuffs—including packers, wholesale grocers, commission men and all similar industries in such manner as will be just and fair to producers and consumers as well as to the industries.

15. We demand strict economy of public expenditures in all departments of government, the cutting out of such customs in transaction of public affairs as adds expense and delay in rendering efficient service, and the discontinuing of all departments of employes which are not rendering efficient service.

16. Where service is needed and actually rendered we favor appropriations adequate to meet that service. We do commend the extension work of the department of agriculture, through the Land Grant Colleges of the several states.

17. We commend especially the Bureau of Farm Management Department of Agriculture, and we believe the work of the Bureau of Markets and Bureau of Crop Estimates should be vitalized and adequately supported to meet the needs of agriculture.

18. We deny statements of some congressmen that farmers demand free seed distribution and condemn the practice.

(Continued on page 160)

Clean Milk Production

By H. R. Martin, '20.

CLEAN milk production is like chess in one respect at least, the more common sense you apply the more successful you will be. Many farmers who retail milk in cities know that it is pretty hard to keep the count down below one hundred thousand bacteria per cubic centimeter. Hence when one says that common sense is all that is needed some of these farmers will scratch their heads and smile. To be sure there are tricks to every trade, but in the produc-

On learning of actual conditions of clean milk production many of our city patrons are somewhat shocked. Their ideal can be realized only by the wealthy men who like to "play at dairying." The average farmer knows that all fads and new fangled notions must be ignored and that an abundance of good common sense must be applied.

The most important points for the producer of clean milk to consider are: udders, utensils, feeding, and low temper-



A handy arrangement.

tion of clean milk common sense goes farther than anything else that the writer knows of. He has had considerable experience with both hand milking and machine milking, but will not expect you to take his word as "prima facie" evidence of the truth of the matter. We would advise that you try out some of the following suggestions before "passing judgment:"

A practical dairyman must not expect to keep everything as "spotless and clean" as does "Miss Phoebe White, who travels right, on the Road of Anthracite" (Lackawanna R. R.). Usually the minute one speaks of "clean milk" the uninitiated picture a 100% perfect process in operation with men in clean white suits, spotless barns, handsome cows with glistening coats of hair, and everything else as clean as a brand new suit.

It goes without saying that the dairy barn must be cleaned thoroughly every day. Nichols, of the Kentucky Agricultural Experiment Station, has found (Ky. Bul. 206) that washing the udders decreases the count to one-seventh of what it would be without washing. If the udders are not washed but are wiped with a damp cloth the count will be considerably decreased. Since this is a very simple operation and takes very little time it should be put into the routine if "clean milk" is the aim.

A small top milk pail is much to be preferred to the open type as these catch a good many of the hairs from the cow's body. These hairs, says Nichols, are laden with bacteria and hence will greatly increase the count as well as decrease the keeping quality of the milk. So far as bacteria are concerned milk is con-

sidered very good if the count is not above one hundred thousand bacteria per cubic centimeter.

Clemmer, Ayers and Cook of the U. S. Department of Agriculture have found (U. S. D. A. Bul. 642) that the greatest source of bacterial contamination is dirty utensils. These should be sterilized with steam if available, otherwise with hot water.

If milking machines are used the production of clean milk is made somewhat

sediment. You can see the amount of sediment in a bottle by holding it vertically above your eyes. Kelly and Gamble (Farmer's Bul. 1019) have found out that an ordinary wire strainer allows over twice as much dirt to pass through as a strainer with eight to ten thicknesses of cheese cloth. They found out that two layers of cheese cloth with absorbent cotton between made the best strainer, although at times the milk does run through rather slowly. Also that it



A handsome herd.

more difficult. This has been the writer's experience after milking fourteen cows for eight months with machines. The "count" will invariably mount up unless one is very careful in sterilizing all utensils thoroughly every day and sees to it that he has a strong anti-germ solution in which to soak the milk tubes and teat cups. Following these precautions and taking care to wipe off the udders with a damp cloth you should be able to get good, clean milk with a low count and enjoy the use of milking machines.

No dust should be raised immediately before milking, hence do not feed hay or milled feeds soon before beginning the milking. If any feeds which will cause dust must be fed before milking feed them at least one hour before you start. This will allow most of the dust to settle.

Milk to be clean must be free from

does no harm to milk when it is placed in cans to cool if the lids are pushed down tightly. It is commonly understood by most farmers that it is very necessary to leave the lids quite loose so that the animal heat may pass off and keep the milk from souring. This may be news to the reader as it surely is to the writer.

After succeeding in drawing good, clean milk from the cow it is very essential that it be cooled to 50 degrees or lower at once. Spring water is usually around 50 degrees and would keep the milk in excellent condition until delivered. If spring water is not at hand the ordinary pump and tank may be used.

In clean milk production the important items to consider then are, clean udders and teats, clean utensils, and immediate cooling to 50 degrees or lower.

The Production of Hot House Lambs

By J. L. Morrow, '20.

THE efficient production of hot-house lambs on the farm is a good illustration of the value of some of the smaller branches of farm production, which are often looked upon as too much of a side line to be considered by the average farmer. The term "hot-house lamb" may be somewhat misleading to some, because of the erroneous belief that the lambs require specially built and artificially heated quarters for their growth. Such, however, is not the case, as hot-house lambs are not the delicate creatures that the name implies, and can really stand quite severe weather provided they are given a reasonable amount of shelter. A barn that is light, airy and yet free from drafts, tightly built, and with a southern or eastern exposure will do very well in ordinary winter weather.

Some of the main advantages of hot-house lamb production are that they require attention during the slack season of the year. Since the entire life time of the lamb is spent in the winter months they are freed from the depredations of dogs, and, furthermore, coming at this season of the year they are less subject to intestinal parasites.

The market demands of the winter fed lamb, that it be of the very highest quality. A fancy price is offered and consequently a fancy product must be put on the market. The carcass must be compact, plump, fat, and so prepared for market that it presents an attractive appearance. The weight that generally tops the market is just about fifty pounds, although, as the season advances heavier lambs are sold but at a reduced price. The season for hot-house lambs extends from Thanksgiving to about the first of April, with the period of the highest prices coming between New Year's and the first of March. The market for this relatively high priced article of food is built up on the demands of hotels, clubs, high class restaurants, and a few wealthy private families. Since the regular spring lamb season ends during the summer months, this class of customers are willing to pay a high price for this article

of food if they can get it out of the regular season.

Production of hot-house lambs requires that the lambs be dropped in the late fall or winter months, and this fact introduces the difficulty of getting the ewes to breed in the spring. It is an inherent trait of most breeds of sheep that they will breed only in the fall of the year. However, there are a few breeds that can be bred to drop their lambs in the fall and these are chiefly the Tunis, Dorset Horn, Delaine, and Rambouillet breeds. Therefore ewes of these breeds are commonly crossed with a ram of some mutton breed, such as the Southdown, Oxforddown, Hampshire or the Shropshire, to produce the winter lambs. Even with the above named breeds of ewes, however, it is usually necessary to resort to flushing in order to get them to breed in the spring. The ewes used for this purpose should be in good thrifty condition and should be good milkers, as it is upon the flow of milk of the ewe that the early growth of the lamb depends. The sire of the lambs should be as thick, lowset, and compact in form as possible without sacrificing quality and refinement. This type of sire will tend to produce lambs that will fatten more quickly and easily and which at the same time will produce the most attractive carcass.

In caring for the pregnant ewe it is seldom necessary to provide any grain if the pasture is good, although, if the ewe is in poor condition some grain should be fed. In addition to pasture, plenty of good clean water, salt, and a shelter in stormy weather are the most important factors. After the lambs are dropped care should be exercised in the early feeding of the ewe. Feed lightly at first. If the milk flow is too greatly stimulated at the start, the lamb will not be able to consume all of it and the result will be that the lamb will scour and the ewe will develop udder trouble, either of which ailments will stunt the growth of the lamb. For the ewe, alfalfa, clover or pea hay are good roughages, and any milk producing grain such as corn, oats, barley, or peas

are very good. The ration must necessarily contain some form of succulence. Corn silage, sliced turnips or mangels are all good.

Continuous and rapid growth should be the slogan of the grower in feeding the lambs. A lamb growing properly should gain at least one-half pound per day, and gains of sixty pounds in sixty days have been recorded. In order to encourage the lamb to start eating grain as early as possible a creep should be provided to enable them to go into a separate pen where they can obtain grain at all times. A good grain mixture for fattening lambs is:

Five pounds of cracked corn.

Five pounds of oats.

One pound of oil meal.

Always clean out the feed troughs before each feeding as lambs do not like to eat feed that has once been nosed over.

The marketing of the fat lambs may be done in three manners, (1) By shipping the live lambs to the commission men, (2) By shipping the dressed lambs to the commission men, and (3) By shipping the dressed carcasses to private customers. The latter is probably the most common method of marketing. In case, however, the dressed carcasses are shipped to commission men, they should be shipped at such a time that they will be on the market by the middle of the week at the latest, as the greatest demands in the large cities are made on the Friday market.

In conclusion a word of warning should be given to the beginner. He must have a ready market, good transportation facilities, be near the market and have an abundance of good feed available. Breeding the ewes out of the natural season, the rearing of the young lambs during cold weather, and the successful marketing of the finished product, all require the ability of a careful and persevering manager.

CHICAGO MEETING OF ASSOCIATION OF COLLEGES AND EXPERI- MENT STATIONS.

The thirty-third annual meeting of the Association of American Agricultural Colleges and Experiment Stations was held at the Auditorium hotel, Chicago, November 12, 13 and 14, Purdue's Agri-

cultural representatives were Dean Skinner, of the School of Agriculture, Superintendent Christie, of the Extension Department and Director Woodbury, of the Experiment Station. Several other organizations representing or interested in Agriculture held meetings at Chicago during the same week, among them being the National Association of Commissioners of Agriculture, the American Country Life Association, the American Society of Agronomy and the Farm Economic Association. The American Farm Bureau Association, the most hopeful and significant of Associations of American farmers, was also organized at Chicago during the same week.

The meeting of the Association of Colleges and Experiment Stations was devoted to the problems of administration confronting the Land Grant Institutions. One of the important topics appearing in one form or another on several of the sectional programs was the necessity for more adequate recognition and support of Agricultural Research. This was the dominant note in the meeting of the Experiment Station section and was emphasized also in the statesmanlike address of Secretary of Agriculture Houston before the entire convention. Secretary Houston explained the fundamental relation of research and investigation to progress in Agriculture and made a strong plea for the necessity of more adequate salaries for Agricultural investigators and for more adequate funds for research both in the Federal Department and in the states.

Important amendments to the constitution of the Association were adopted through which the name was changed to "American Association of Land Grant Institutions." The special reason for this was to centralize the legislative authority of the Association in the Executive section, composed of College Presidents, and to provide for more formal recognition of the interests of Home Economics and of Engineering in the activities of the Association.

The next meeting will be held at Springfield, Massachusetts, in connection with the fiftieth anniversary celebration of the Massachusetts Agricultural College at Amherst.

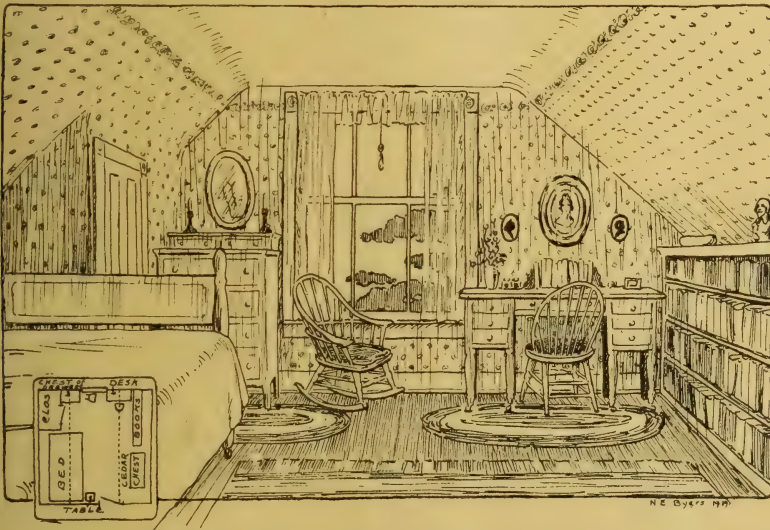
Furnishing The Bed Room

By Nellie E. Byers '20.

THE chief concern in planning a bedroom is convenience. After that come cost and artistic effect. For convenience sake, have the furnishings tending toward comfort and dispense with every item that does not contribute to this end. Most of us own our furniture already, and the problem is merely one of convenient arrangement, but for you who are buying, the unanimous advice is to buy as little as possible and do the best you can with it, until prices go down. After all, the most beautiful rooms have no unnecessary things in them.

chief object is to furnish a background, and so should be plain or have only a small indistinct stripe or figure. Avoid figures that insist upon being "counted" when you are half asleep. Stripes add apparent height to a room. Drop ceilings and picture moldings make the ceiling appear lower. Bright colors or large designs make a room smaller, while quiet colors in plain paper increase the apparent size.

Net, marquisette, scrim, and muslin are the favored fabrics for bed-room curtains. If over draperies are desired, silkoline, voile, and cretonne are all good. In this



A combination bed room and sitting room is possible even in the half-story room.

The bed-room should be rather light. The floor should be the carpet part. Unless it is absolutely necessary, do not put a carpet down. It is an unsanitary method of covering the floor. A large rug that can easily be cleaned hides an unsightly floor and is preferable to a carpet. Best of all is the bare floor, waxed, varnished or painted, with small rag rugs covering the places receiving the hardest wear. The rugs should have a plain inconspicuous design and should harmonize with the principal color in the wall paper, curtains and upholstery.

The walls should be lighter than the floor, but darker than the ceiling. Their

age of efficiency, plain hems or a narrow lace edge are preferable to ruffles and elaborate crocheted panels. If the room is dark, make the windows seem larger by leaving the center open, with thin curtains at the sides and across the top, covering the wood-work (an easy way to hide ugly woodwork). The windows will look longer with narrow side draperies reaching nearly to the floor, with nothing in the center; the opposite is true for short full curtains with a valance across the top. With figured walls use plain draperies; figured ones may be used with plain walls.

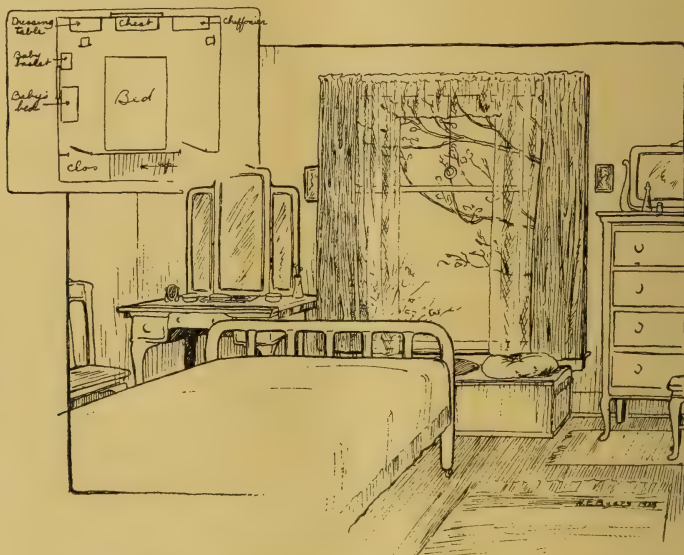
If the room is small, have only the

most necessary pieces of furniture in it. Furniture of light colored woods gives a roomier effect than does dark finished pieces. The best colors for enameled furniture are ivory, cream, white, and gray. Unpainted reed is inexpensive and good looking. Furniture for a man's room usually is dark and very substantial, but a girl invariably chooses a lighter effect.

Never arrange the large pieces of furniture diagonally across corners of the room. It looks much better and leaves more floor space if it follows the lines of the walls.

the bed in front of a window insures good ventilation, but is not always practicable. If the bed is to be used during the day, as in a sick room, do not place it facing the light, as constant light irritates the eyes.

Light, easily washed spreads are most in favor. The light weight spreads of dimity that does not require ironing are good. One of the prettiest styles is made of unbleached sheeting with a plain or figured border stitched on, with window curtains and dresser scarfs to match. No more beautiful spread could be had than an old-fashioned appliqued quilt.



Good lighting means easier dressing.

Enameled iron beds are very popular just now, and bid fair to hold their place, because of the ease in cleaning them, their light weight and their low cost. Moreover, they look well with most furnishings. Beds having round tubing are least expensive and wear longest. Fancy curves and gilt paint are to be avoided always.

If the room is to be used during the day, a davenport or a "sanitary folding cot" looks better than a bed, in some rooms and does not take up so much space.

Whenever possible it is best to arrange the bed with only the head against the walls, as much better ventilation is obtained by such an arrangement. Placing

For dressing, a woman likes a dressing table or dresser, while a man much prefers a chiffonier. Either one should be placed near a window, so that the light falls on the face rather than on the mirror. If two people are using the room, it saves time to have a dresser or chiffonier for each.

Have very few articles on the dresser. Nothing wastes more time in dressing and makes a bed room look worse than a dresser loaded down with a disorderly array of pin cushions, trays, cosmetics and small articles of clothing.

If there is no closet, a wardrobe is sometimes necessary and it should be near the dresser if possible. Even a curtailed off corner looks better than having

clothing hung on the wall or door, and keeps the clothing much cleaner.

A long mirror sometimes is placed in a door—very convenient but rather expensive. (By the way, plate glass mirrors without bevelled edges are quite as good as bevelled ones and are less expensive).

Straight chairs are usually used in bed rooms, especially when there is a dressing table. When buying see that the legs and back are well braced. The strongest chair has the rear legs extending up to form the posts of the back. If there is room enough, have a rocker by one of the windows, or by the fire if there is a fire in the room. This may be a little sewing chair without arms, or (if the room is to be used as a living room) it may be an easy chair—upholstered perhaps. Place your work basket nearby.

One of the most convenient pieces of bed room furniture is the chest. This may be a cedar chest, a steamer trunk, or even a padded and covered packing box. Cover it with a pad to match the wall paper or the window draperies, put a cushion or two on it, and use it for a window seat, in which to store bedding, old magazines, or extra clothing.

A small table by the head of the bed is a most desirable luxury. On it can be a light, a book to read when you cannot go to sleep, a glass of water if you like a drink in the middle of the night. For the sick room meals a drop leaf table can be extended over the bed to hold the dishes off the patient's lap.

The combination bed room and living room is not advisable for the small room,

but where there is space enough and one cares to go to the extra expense, it is very convenient. As mentioned before, a davenport or couch is preferable to a bed in most cases. A desk or writing table with a straight chair usually is included. Place it on the right side of a window or night light, so that the light will fall on the paper when writing. Have it well stocked with paper, envelopes, stamps, pens, pencils, ink, clips, a calendar, a pair of scissors, rubber bands, etc.

A book case holding your favorites and an easy chair near the light complete the necessities for this comfortable combination room.

As for pictures and bric-a-brac, the bed room is the best place to exercise one's personal tastes, unrestrained, and no one else should have much to say about it. The best looking rooms, however, do not have every available wall space filled with gaudy gilt frames that outshine their canvases, and every inch of table and dresser top covered with shell pin cushions and red flowered vases. To achieve the best effect go to the other extreme. It really is astonishing to see the amount of gimcracks your room can do without.

The whole effect of the room should be that of quiet and restfulness. And the chief requisite for keeping it so is orderliness. Ask yourself these questions about every object in your room—your house, even:

"Is this useful? Is the room more beautiful when this is in it? Is this in the best place it could be in?"

Flea Beetle Injury

By J. J. Pryor, '20

The crops usually suffering the most from this pest are those of the garden. The beetles are so small that they are hard to detect and again their life history is as yet imperfectly understood, but enough is known about them and their control to enable the farmer to be on his guard in case of an attack.

1. The Potato Flea Beetle.

This variety works on the young potato and tomato plants when they are a

few inches high. Myriads of small black beetles, called flea beetles because of their power to make quick long jumps, cover the plants and quickly defoliate them so that replanting is necessary especially with tomatoes. Both the tobacco and potato beetles work on potatoes. In sections where tobacco is grown the tobacco beetle is most prevalent, but on the whole the potato flea beetle is the most destructive.

It is only one-sixteenth of an inch in length, and jet black, except for the yellow legs and feelers. There is a deep groove on the back at the base of the wings. The extent of its injuries is greater in the northern states though it is prevalent throughout the country. It should be born in mind that this beetle is sometimes known as the cucumber beetle. It is more injurious, however, to potatoes than to cucumbers.

Life History—The beetles hibernate under leaves and rubbish for the winter. In the spring they lay their eggs on the roots of jimson and horse nettle weeds. The larva mine in the roots of these weeds, go into the pupa stage in small earthen cells among the roots and emerge to attack the young tomato and potato plants. Sometimes these larvae work on the tubers giving rise to pimply potatoes. This injury occurs later in the season. The work of the adult in the spring is the most destructive. They completely riddle the leaves giving them the appearance of having been hit with a charge of bird shot.

Control—Bordeaux mixture is the best repellant. Apply this when the plants are small. This spray is also effective in warding off fungus diseases. So two purposes are accomplished. Follow the Bordeaux spray with arsenate of lead or Paris green, one pound of arsenate of lead to ten gallons of water is a good strength. For the garden it would be well to dip the tomato plants before setting out.

During cultivation keep down all obnoxious weeds. This hinders development of the beetles. If damage to the tubers by larvae is present when they are stored, it is wise to use Carbon bisulfide. Use five to eight pounds per one hundred bushels. Put in pans, one half pound to the pan and set in the bins on top of the potatoes. Cover with blankets, canvas or whatever is handy. The gas is heavy and will sink down among the potatoes. Allow no fire to come near till bins are aired. Leave the gas in for a day. The fumes are poisonous.

2. The Pale-Striped Flea Beetle.

Enormous numbers of these often appear in late June and early July and if unchecked will ruin the young crops which they attack. The outbreaks occur periodically so that usually the grower is

unprepared to meet them. They have ravenous appetites, feeding upon corn and tomatoes in particular but also upon beans, beets, potatoes, eggplant, carrots, turnips, melons, pumpkins, squashes and gourds. They will attack any crop at hand when they are present in large numbers. The species is common in the United States but does most damage in the Middle West.

Description—This beetle is one-eighth inch long, (larger than its relative, the Potato Flea Beetle) cream colored and marked by three stripes of dull light brown. The eyes and abdomen are black. There is a related species known as the banded flea beetle which has a black back with two white stripes. They perform about the same as their cousins the pale striped and are controlled in the same way.

Life History—They occur in June or July in great numbers, gnawing holes in plant leaves at once. They will defoliate the plant in three days if not stopped. The roots of the jimson weed, lambs quarter and others are attacked by the larvae. These larvae are about one-eighth inch long, white with brown heads. The rear segments taper to a conspicuous, prolonged process surmounted by a number of stiff tiny hairs. The insect winters in the larva stage in the roots of the weeds mentioned.

Control—Plow under any field left to grow up in weeds in late summer for it is important to destroy the larvae. Bordeaux mixture with three pounds of Paris green per barrel sprayed on heavily as soon as the insects are noticed will check the attack.

Dusting the plants with paris green and lime is also a good repellant. Spraying with kerosene emulsion is effective also. This is made by dissolving one half pound of whale oil soap or one pound of soft soap in one gallon of boiling water, adding two gallons of kerosene, churning for five or ten minutes with a force pump until emulsified, then diluting to a one to ten or one to twelve solution.

Billy Sunday says that a person gets a new idea of hell every day he lives. It must be admitted that living at the present pace and price is not altogether heaven.

Oat Production in Indiana

By L. A. Daugherty, '21.

AMONG the grains raised in the United States, oats ranks third in importance. The average acreage for this country, 1912-1916, was 39,459,000 acres with a production of 1,296,437,000 bushels. Indiana ranks eighth among the states with an acreage of 2,025,000 acres in 1918, and a ten year average

oats as they hold water well. However, sandy soils having a moderately stiff sub-soil will grow oats. Good drainage is essential, poorly drained heavy clays being undesirable. Rich lowlands usually produce too rank a growth which lodges.

White oats is a vigorous feeder and will do better on poor clay soil than the other



The dry method of formalin treatment for smut.

yield of 44 bushels per acre. The fact that some farmers secure twice the average yield should encourage all to better their methods and increase production.

Climatic and cultural conditions are of much importance, affecting the yield even more than the fertility and character of the soil. The northern and cooler half of the state is better for oats. To make the best growth they need a cool, even temperature and plenty of moisture. More water is required to produce a pound of dry oats than for any other grain.

Clay and loam soils are best suited for

common grain crops. Any considerable amount of nitrogen added either in manure or commercial fertilizers may result in rank growth and loss by lodging. For this reason manure is usually not applied on oats ground but rather on the corn ground. Most Indiana soils need phosphorus. An application of 200 lbs. of acid phosphate per acre will result in an increased yield. Owing to the low commercial value of oats, fertilizing directly with commercial fertilizer is frequently not economical.

New land should never be sown to oats

but rather to corn for a year or two. The best rotation in districts where wheat is profitable is corn, oats, wheat, and clover. The fact that oats is a rather poor nurse crop is the chief objection to a corn, oats, clover rotation.

As a rule not enough attention is paid to the preparation of the seed bed for oats. The work should begin as soon as the ground can be worked. After corn, the stalks should be broken and the ground double disced and harrowed. In

pile is spread out to dry. The treating should take place not longer than one or two days before sowing. The wet method is very unhandy compared with the dry. When the dry method is used the oats may be sown within six hours after treatment. The danger of damage to the oats by heating or sprouting before it can be sown is removed. One pint of water and one pint of 40% formalin are mixed, and placed in a sprayer. As the oats are shoveled over, just as cement is mixed



The direct result of seed treatment. The left and center bundle came from untreated seed. The right bundle came from treated seed.

a very dry spring it is well to cultipack or roll the land after seeding. Among the best varieties as found at the Purdue station during a number of years of experimentation are Silvermine, Swedish Select, Great Dakota and Big Four. Home grown seed is usually best.

The seed should first be cleaned and graded to get rid of weed seed and chaffy oats. All the seed should be treated for smut as Indiana's average loss from smut is 12%. An investment of \$34,000 for seed treatment in Indiana would yield a return of about \$3,750,000 from increased oats yields. Either the dry or wet formalin method may be used. In the wet method 1 pint of 40 per cent formaldehyde is mixed with 40 gallons of water and one gallon of the mixture is used to each one and one-half bushels of oats. The solution is sprinkled on the oats while it is being turned. The pile is then covered with wet sacks or blankets and let stand for two or three hours when the

by hand, the mixture is sprayed on. The pile is covered as before and left for five hours when it may be sown. Sacks to be used and the drill must be treated also if smut is to be controlled properly.

Oats is drilled or broadcasted at the rate of 8 to 10 pecks per acre. Drilling is much the better practice as less seed is required, it is better covered and the seed is more evenly distributed. The increased labor will be paid for in increased yields. The seed should be covered to a depth of 1½ inches in moist soil and 3 inches in dry. The date of seeding is about March 15 to April 15 in the northern part of the state.

The farmer who raises only an average crop of oats makes little if any profit. But by proper attention to selection and treatment of seed, and preparation and fertilization of the ground oats may be made a profitable crop where the climatic conditions are suited to its growth.

The Carpet Beetle, or Buffalo Moth

By F. D. Poe, '20.

THE carpet beetle, *Anthemus Scrophulariae*, has in recent years become the worst of household pests, feeding in its larval state on carpets, woolens, furs and feathers. The larvae are active, short, fat, brown grubs, densely clothed with stiff dark brown hairs which are longer at the sides and still longer at the ends than on the back. They live in cracks of floors, under furniture and near edges of rooms, working in a hidden manner from under the surface, sometimes making irregular holes but more frequently following the line of the floor crack and cutting slits in the carpet. They also enter wardrobes and destroy clothing.

This insect is occasionally found in the Southern states but is very common throughout New York, and, all the New England states and west through Ohio, Indiana, Michigan, Illinois, Iowa and Kansas. It is found in all parts of Europe and was imported at New York and Boston about 1874.

The adult is a pretty little beetle which may be found in infested houses in the spring, on the ceilings and windows. It is a small broad oval beetle about one-seventh of an inch long, clothed with minute black, white and brick-red scales which give a marbled black and white appearance with a red stripe down the middle of the back widening into projections at three intervals. When this beetle is disturbed it plays 'possum, folding up its legs and antennae and feigning death. As a rule the adults begin to appear in the fall and continue to issue, in heated houses, throughout the winter and following spring. Soon after issuing they pair off and the females lay their eggs in convenient places. Under favorable conditions the eggs hatch in a few days and with plenty of food the larvae develop rapidly. Under unfavorable conditions such as cold weather or lack of food, development is retarded, but they may remain alive and particularly in a dry atmosphere for an almost indefinite period, molting frequently and feeding upon their cast skins. Under normal conditions the skin is cast about six times. When the

larva is full grown a yellowish pupa is formed within the last skin. The skin soon splits down the back and reveals the pupa from which the adult beetle later emerges. The beetles fly in the day time and are attracted by light when not engaged in egg laying. They fly to the window and out if it is open to feed on the pollen of flowers. This migration from the house usually takes place after the eggs are laid.

Conditions are favorable for a great increase of this insect only where carpets are used. One of the best ways to avoid the ravages of this pest is to use rugs instead of carpets and to trap the larvae by placing woolen cloths on the floors of closets. By shaking such cloths over a paper once a week the larvae can be captured. This insect is known in Europe as a museum pest. It is known to have this habit in a few localities in this country, but in these cases it has been imported from Europe in insect collections.

Once a house is infested it is hard to eradicate them. There is no easy way to keep the carpet beetle in check. House cleaning but once a year often carelessly and hurriedly done is favorable to the development of the insect. Two cleanings are better than one, and one in the middle of the summer would be better than at any other time of the year. The carpet should be taken up, thoroughly beaten, sprayed with benzine and allowed to air for several hours. The rooms should be thoroughly swept and dusted, the floors washed with hot water, the cracks carefully cleaned out and kerosene or benzine poured into the cracks and sprayed under the baseboards. "Benzine and even its vapor when confined is extremely inflammable and fire should be guarded against while using it." Any cracks in poorly constructed floors should be filled with plaster-paris to lessen the number of harboring places for the insect. Before replacing the carpet tarred roofing paper should be placed over the entire surface or at least around the edges and the carpet only loosely tacked so it may be raised up at times to examine for the in-

(Continued on page 164)

Why Farmers Should Keep a Farm Record

By W. Jackson, '22.

IT is said by men who know that poor accounting in city business is the direct cause of more business failures than any other shortcoming. Likewise a great many cases of failure or mediocre success in farming are the direct result of the same cause. For a farmer is a business man just as much as is the manufacturer or the retail merchant. He has a large investment of capital in land, farm buildings, machinery, live stock and crops; he labors the year 'round to make money out of this investment; and it is to his interest to know at the end of the year or at any time during the year whether his labor is making him money or not.

No successful manufacturer of today would consider running his business without a good system of bookkeeping to show him his profits and losses. One of the large packing houses at Chicago, for instance, knows at the end of the year exactly how much profit it made on its smoked meats, its frozen meats, its canned goods, etc. In the same way the farmer should know whether he is making or losing money on his wheat crop, his hogs, and his orchard. This will enable him to improve his business each year, and to correct his mistakes of the year before.

Many a farmer realizes the value of an accurate farm record and would really like to keep an account of this sort, but does not know how to start. Or he may have been discouraged by a neighbor who has tried to keep a complicated system of books which was not adapted to farm needs.

A FARM RECORD BOOK which is well adapted to the needs of the Indiana farmer has been compiled by the Agricultural Extension Department of Purdue University co-operating with the U. S. Department of Agriculture, and it may be obtained by writing to the Extension Division, Office of Farm Management Demonstrations, LaFayette, Indiana, and enclosing fifteen cents.

This book is made to contain one year's record of the farm business. It is divided into three main sections: One for all

transactions in which money is received, one for all expenses, and the third for an inventory of the farm and everything of value on it. There is also space for a summary of the year's business, a breeding record, a crop record, general farm notes, and other records that should be kept.

This record book greatly simplifies farm bookkeeping. No knowledge of bookkeeping is necessary for its use. Each page explains itself. But what is more important, it is a system of bookkeeping that is adapted to the farm in a practical way. At the end of the year the book will show the net income from the farm and the labor income.

This farm record book will also enable the farmer to present the banker with a clear business-like statement of his farm's worth if he wants to secure a loan. And, bringing it down to the present day, the book will be found of value when making income tax returns.

The book can be started at any time, but there is no better time than January 1. This is a good time to make the inventory as there are few growing crops, the farm business is at a quiet stage, and the farmer himself is not likely to be rushed with work. January 1 is but a month away. It is safe to say that once a farmer keeps an accurate record for one year he will never afterward run his farm business without one.

HOOF AND HORN HOLD FALL INITIATION.

Hoof and Horn, honorary animal husbandry society, initiated ten men from the senior class in Agriculture. H. L. Jones, H. W. King, L. A. Jessup, W. E. Heller, H. L. Bundy, L. M. Kirkpatrick, J. L. Morrow, O. B. Riggs, C. W. Crosby, B. F. Sellars.

Hoof and Horn elects its men each year from the juniors and seniors in the school of Agriculture who elect animal husbandry. Scholarship, character and marked interest in animal husbandry form the basis of the selection.



Dear Boys and Girls:

Every one around here is busy getting ready to go to the International Stock Show at Chicago. Do you know I had heard about that show when I lived on the farm but never knew much about it. Now since I came to Purdue the boys have told me that it is the biggest live stock show in the world and that is saying a lot. They also say that Purdue has won a lot of prizes in the last two years with the fat steers and pigs and sheep that Dean Skinner has sent up there. It seems to me that pigs are getting almost more of these trips around to the big shows and fairs than anyone else is. Why sometimes I almost wish that I was a pig myself. The boys' and girls' club get their names in the papers a great many times too but then they are learning to be better farmers and deserve to get a share of the praise. Just yesterday I was in Prof. Gobble's office and saw a picture of a bunch of boys in a picture with a fine black steer. I asked about the picture and was told that it was some member of boys' clubs and Fyvie Knight II, the Purdue steer that won the Grand Championship at the International last year. I couldn't tell who felt the proudest in the picture, whether it was the boys or the steer. If they take a picture like that this year I'm going to try and be in it.

You remember about my master Jack, don't you? Well he is on the stock judging team that goes from Purdue to be in a contest with the judging team from other universities. Gee, it makes me proud to think that I can say my master is a member of such a team and from now on I'm boosting for him to be one of the winners. If you boys and girls will take advice from me, just a common cur, I would say "Get all of the club work that you can and then go to college and take pharmacy and try to get on a stock judg-

ing team." If you can do that you will have right to feel just as proud as I do when I remember that I am the only dog that ever went to college to study pharmacy.

Mr. Z. N. Smith, whom you all know, just told me something that will surely interest all of you. He said that thirty-five club members are going to the International from Indiana. Two are going from Grant county, three from Noble, four or five from Newton, two from Henry, two from Huntington, three from Fountain, three from Warren, two from Johnson, two or three from Tippecanoe and a few from some of the other counties. Your friends Mr. F. M. Shanklin and Miss Grace L. King, from Purdue, are going to be in charge of the party. Armour & Co., are going to pay the expenses of five club members, Wilson & Co., the expenses of ten, Leonard & Co., the expenses of ten and the others will be sent by their own Farmers' Bureau, banks and other home organizations. Those boys and girls are going to have some trip and some good time for I saw the schedule and there are a lot of fine things in store for them. They are going to Chicago Sunday and stay nearly the whole week. The bunch will see the stock show, go through some of the big packing plants, take a trip through Chicago and see the big stores, museums and all kinds of sights, go through the big parks and have a big time all week. I'm to be in the bunch and expect to learn a lot of things to tell you next month. When you read this I'll be getting home all tired out but with a lot of things to write. I want some of you boys and girls who go to write to me and tell me what you thought about the trip. Address your letters to "Rover", in care of the Purdue Agriculturist, West Lafayette, Ind. There will be some pictures for you next month.

ROVER.

THE PURDUE AGRICULTURIST

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

WINTER HOURS

The long winter season is almost upon us and we are again confronted with the old question of how we shall use our time. Of course there is always something in the way of feeding or some other odd job to be done on the farm. But these take up but a small part of the time and there are many other things to which the farmer and his family can turn for occupation of their otherwise waste time. Country people are today able to enjoy some of the pleasures to which they have a right and in which they take much interest.

The farmer is tired of hearing his city brother preach efficiency and is coming to resent being told how best to run his affairs. He sees plainly that the proper amount of entertainment is a thing to be desired. The slack season of the winter months bring to the country a great many things that are useful as well as pleasurable. The lyceum bureaus give excellent programs in almost every town and high school. The schools themselves give their public entertainments of the year. The farm bureaus, boys and girls' club workers, the home demonstration agents and many other useful agencies are all working to entertain the farmer, and give him knowledge which will be of use in the future. The agricultural colleges give short courses in vari-

ous specialties through the winter months. The great stock shows that draw the interest of the whole country are staged in the winter.

In short the winter is the season which gives us a chance to see and enjoy the good things that have been produced through the long months of summer toil. We can see that our labor has not been in vain and we take pleasure in learning the things that will better fit us for the coming years. The winter hours on the farm hold a golden opportunity indeed.

THE ANNUAL WINTER COURSE.

Mr. Farmer, are you going to attend the winter course at Purdue this year? If you haven't fully decided as yet, you had better do so at once, as the course opens December 29, and lasts until February 27. This course begins after the fall work is through and ends before the spring work begins, making it possible for at least one member of every farmer's family to attend. This course ranks next to the regular four year course and as many of the young farmers of the state who possibly can should attend. Upon completion of the course a certificate will be issued you to the effect that you have successfully completed one winter course. There will be courses given in General Agriculture, Animal Husbandry, Commercial Dairying and

Home Economics. You can choose whichever one you want. The regular winter course will be suspended during the Farmers' Short Course which will be from January 12-16. This will give you, as a winter course student, the opportunity to hear all the lectures that will be given during the Short Course and attend all the practical demonstrations which are given at that time. A person must be at least 18 years of age and must have a good common school education. Only one fee of \$10 will be charged and that will be for actual expenses of materials used in the laboratories. Persons living outside of the state are to pay a tuition of \$10 in addition to the laboratory fee. The other expenses will be those needed for room, board and books. If you haven't been able to attend the regular four year course and want a good scientific basis for your agricultural work on the farm, you can not make a better decision than to come to Purdue and attend this year's winter course.

WHO ARE AMERICANS?

A study of the Thirteenth Census of the United States taken in 1910 reveals some striking facts in regard to the number of foreign born to our country and the various vocations in which they are engaged. In that report we find that there were more people engaged in Agriculture than in any other occupation.

This fact is made the more interesting when we consider that of this number only 25.4 per cent were foreign born. This was the smallest number of foreign born engaged in any single vocation, with the exception of a very small group composed of salt mine, gas and oil well workers, which contained 22.1 per cent.

Going farther it was found that in the other prominent groups such as textile workers, iron and steel workers, and miners, two-thirds of the total number engaged were foreign born. In a few of the smaller groups such as the liquor and beverage industry, there were 72.9 per cent foreigners; in the worsted mills 77.2 per cent; in the clothing industry 80.3 per cent.

It is interesting to note that Agriculture, by far the greatest industry in the number of people employed, is distin-

guished by having a native element in a comparatively high degree.

SEED CORN STORAGE.

The two things to be considered in storing seed corn are dryness and a free circulation of air at ordinary temperature. A very practical method of storage is the laying of the ears on two pieces of binder twine, crossing the cord each time after laying one ear in place. The ears should not touch each other and the butts and tips be reversed each time. Ten to twelve ears may be placed on each string.

Driving spike nails at an angle through a board and placing the ear over the spikes, butt first, has proven a very efficient method. The husk may be retained on the ear after it is drawn back and the ear hung from the rafter, wire racks with horizontal and vertical strands, thus putting the ear in a sort of pigeon hole are practicable. After corn has been thoroughly dried the low temperatures will not injure it, but precaution against severe freezing should be taken throughout the winter.

THE ANNUAL FLOWER SHOW.

The annual flower show held Saturday and Sunday, November 8-9, proved to be one of the largest and most successful ever held at Purdue. This was the first show held during the last two years, due to war conditions, but interest was not lacking, judging from the large crowd which attended.

The featuring display consisted of a bench of thirty different varieties of chrysanthemums. They were of every imaginable color and ranging in size up to twenty inches in circumference.

A hundred specimens of the Chrysanthemums were later sent to Indianapolis for the flower show held there November 13 and 14. The rest of the flowers on exhibit were put on sale and were very rapidly sold, many of them being sent to distant cities.

More flowers should be grown around the home and farm homestead. To the Purdue annual flower show is due a great deal of credit for increasing this interest in the culture of flowers. Let's have more flower shows throughout the state.

INDIANA FEDERATION OF FARMERS' ASSOCIATIONS HOLDS ANNUAL MEETING.

Approximately six hundred farmers attended the first annual convention of the Indiana State Federation of Farmers' Associations held at Indianapolis on November 18.

Eighty-one counties, all of which have been previously affiliated with the state organization, had delegates at the meeting. Eleven counties in the state have not yet completed organizations. The organization embraces approximately 40,000 Indiana farmers at the present time.

The meeting was snappy all the way through and business was transmitted with dispatch. President John G. Brown, of Monon, opened the session with a short talk outlining the principles of the association and the imperative need for further work. Mr. W. H. Hickman presented a silver cup to W. H. Lawson, delegate from Benton county as a reward for being the first county over the top in the guarantee fund drive of the Federation. The delegate from Bartholomew county received a handsome flag, as his county had the largest oversubscription in the drive.

General Secretary Lewis Taylor gave a good report of the work of the association since March. William Bosson, special treasurer of the Guarantee Fund completed a complete financial report showing that the organization was in good condition with assets of approximately \$33,000.

John G. Brown was re-elected president for another year; Everett McClure, of Dearborn county, first vice-president; Maurice Douglas, of Flat Rock, second vice-president. In the election of directors, R. E. Warren was re-elected in the first district; E. E. Reynolds third district; Oscar Larm fifth district; Joseph Raub seventh district, and J. J. Brown ninth district. All of these men are farmers and agricultural leaders and the organization can be commended for its good choice of officers. The other district directors hold over another year.

The constitution and by-laws were amended to meet new developments in the work and resolutions were passed con-

cerning recent developments affecting farmers' problems. The constitution and by-laws of the national association were ratified, and Indiana was the first state to ratify. John G. Brown, W. H. Hickman, and W. O. Adams were elected as representatives to the National Organization. Everyone was highly pleased with the enthusiasm and harmony of ideas which prevailed throughout the convention. The influence of the Federation is spreading rapidly and it is now looked to by the farmers of the state for leadership in the agricultural field.

INDIANA CATTLE FEEDERS MEET AT PURDUE DEC. 12.

The annual meeting of the Indiana Cattle Feeders' Association will be held at Purdue University Saturday, December 12. The meeting will include an excellent program and inspection of the seventy head of steers which will be divided into ten lots before the meeting.

An address by C. C. Fischer, of Union City, president of the association, will open the meeting at 10:30 o'clock and he will be followed by C. M. Vestal, of the Experiment Station staff, who will discuss the hog feeding experiments at Purdue and arrange to give the results to the members of the cattle feeders' association. F. G. King, of the Animal Husbandry staff, then will discuss the cattle feeding work. Inspection of the cattle will follow with the continuation of the program after lunch.

Frank C. Beall, formerly an instructor on the Animal Husbandry staff at Purdue, who recently accompanied a shipment of Indiana pure-bred Polled Shorthorns to South America, will tell his experiences there with beef cattle men and John T. Alexander, Chicago commission man, will give the market outlook. H. P. Rusk, of the University of Illinois, will give the results of his experiments with "Corn Stover Silage."

Dean J. H. Skinner of Purdue is secretary-treasurer of the association, which has several hundred members.

The most tiresome man in the world is the one who has read everything and remembers it all.



This 17 Year Old Girl Milks 27 Holsteins With the Perfection

Twenty-seven cows, especially when some of them give as much as 100 pounds in a day, is quite a bunch for a girl to milk. When Theodore Gillis' 17-year-old daughter can handle them all alone with the Perfection, it's not hard to understand why Mr. Gillis thinks his milker is a wonderful machine.

Mr. Gillis has labor problems just like everybody else. And sometimes he's right up against the wall for hired help. But since he has a Perfection, his daughter can always help him out. "The Perfection Milker was rightly named," he says, "for it is a perfect milker and so easy to operate that my daughter, 17 years old, has milked my whole herd of 27 Holstein cows every night during the summer when we were short of help.

The Perfection Gets More Milk.

"The Perfection gets more milk than any hand milker can get from my cows. One of my cows, 5 years old, gave as high as 102 pounds of milk in a day. A heifer gave 64 pounds in a day. One of my cows, which had been milked nearly two years without freshening we could not dry up without taking the machine off her.

Just Ask Your Neighbors.

"We have several other kinds of milking machines in this neighborhood but everyone seems to think the Perfection gives the best results and is the most reliable machine."

Names, Addresses and Catalog Waiting For You.

How much would it be worth to you to have your milking problem solved? Find out about the Perfection Milker. We'll gladly send you names and addresses of owners so you can investigate for yourself. Just ask the men who own Perfections what they think of them. We will also send without charge a copy of "What the Dairymen Wants To Know," the book that answers every question about milking machines. Write.

Perfection Manufacturing Company

2146 E. HENNEPIN AVENUE

MINNEAPOLIS, MINNESOTA

The Perfection Is The Milker With The DOWNWARD Squeeze Like The Calf.

PERFECTION MILKER

Fall Dairy Calves

By L. H. Fairchild, Dairy Dept.

MOST of the dairy products are produced on farms where dairying is not the chief source of income. Practices for improvement of dairying on these farms, therefore, should be planned to fit into the general farm arrangement.

The idea of attempting to have dairy calves come at any particular time of the year is one that has never been given any consideration by many farmers who keep dairy cattle and produce a large part of our milk and cream. This is a practice that is well worth following for several reasons, namely:

(1) Utilizing farm labor in the winter time,

(2) Getting the highest flow of milk during the coolest part of the year,

(3) Having the calves weaned and ready for pasture when the pasture is at its best.

The last reason is the one that we are most concerned with in this article.

In order to have the calves born in the fall it is necessary to so arrange breeding dates that cows will freshen at this time. They should calve after the hot weather of the late summer and early fall has passed. The latter part of September or the early part of October is about the most desirable time to have cows calve. From this time on there is less of other farm work to be done and more time can be given to the care of the calves.

It is natural for calves when with their mothers to take milk in small quantities and at frequent intervals. The ordinary practice is to feed calves only twice a day. In the fall and winter months when work slackens up on the farm it is convenient to take time to feed the youngest calves three times a day, thus more nearly approaching nature's method. This practice will not usually be followed in the summer, however, as the field work requires so much time. This is one reason that fall calves usually get a better start due to the better methods of feeding. In the fall and winter months two other unfavorable factors for the growth of calves are also eliminated—

extremely hot weather and flies. These are two factors that hold back the growth of spring calves and which fall calves do not have to meet.

When the calf is born in the fall, however, it spends the early part of its life in the coldest part of the year. It is necessary therefore that warm, comfortable quarters be provided. A calf cannot grow when it is using all the energy value of its feed to keep warm. Calves should be well sheltered, kept in dry pens, and be well bedded. These items give a great deal of comfort to the calves and enable them to use their feed to a greater production of growth. Individual calf stalls are much to be preferred and can very easily be provided. Calves kept alone get better care, can be watched more closely, and more attention can be paid to individual feeding. Calves should have some form of exercise and paddocks or lots adjoining the calf barn can be used for this. They should be turned out part of every sunny day, but never left out exposed to the cold.

By the time the calf is six months old it is old enough to be weaned. Fall calves reach this age at the time the pasture is beginning to start and the very best feed for a calf after weaning is grass. From this time on fall calves can be on pasture almost continually and can take advantage of the entire pasture season. Spring calves, however, are too young to get much nourishment from the grass until the latter part of the summer, at which time the pasture is so short that it is necessary to supplement with hay and grain. By the time the spring calf is ready to wean the pasture season is about over and it is then necessary to continue feeding hay and grain throughout the fall and winter, so that we have to feed the spring calf a whole year before it goes on pasture. The fall calf, however, has had almost six months of pasture by the time he is a year old.

Calves, therefore, can be raised cheaper, better and more nearly like nature's way by having them dropped in the fall.

Cletrac

TANK-TYPE TRACTOR

(Formerly known as the Cleveland Tractor)



Why the Cletrac Stays on Top

Try to push a loaded wheelbarrow through soft plowed ground. You have to exert every ounce of your strength. The wheel sinks in deeper and deeper until you are finally "stuck" and have to take off the load.

But lay a plank over the same soft ground and you can roll the same wheelbarrow over it with the same load with almost no effort at all.

It was the plank that made the difference. Its broad, flat surface distributed the weight of the load so that there was very little pressure at any one point.

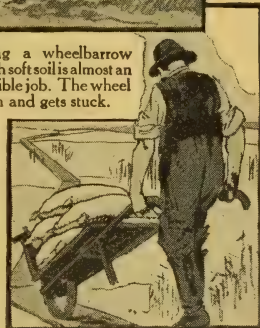
And right there you have the principle back of the Cletrac Tank-Type Tractor. It runs on broad, flat, metal tracks which reduce the weight per square inch to but $4\frac{1}{4}$ pounds.

The Cletrac stays on top, doesn't mire or dig in and puts all of its power into pull.

Because the Cletrac works so efficiently on soft ground it is the ideal tractor to fit the seed bed as well as to plow and its compact, economical power is available for all sorts of farm work, every day in the year.



Pushing a wheelbarrow through soft soil is almost an impossible job. The wheel sinks in and gets stuck.



Lay a track of boards over the ground and you can roll along easily enough.

The Cleveland Tractor Co.
Cleveland, Ohio

The largest producers of tank-type tractors in the world

Free Tractor Book
Write for our illustrated book, "Selecting Your Tractor" which is a practical treatise on power farming.

Feeding Laying Hens

By J. R. Smyth, '20

AT this time of year when the laying hens must be kept confined in close quarters there are many feeding problems which demand the attention of the poultryman. In the spring and summer the hen usually has access to plenty of range and can pick up much of her green feed, animal feed and grit, but when confined these feeds must be supplied in some form.

We feed the hen with two objects in mind; first to maintain her and secondly to supply food from which eggs are to be made. If we are feeding for eggs it is poor economy, to feed just enough to maintain the hen in health and vigor. Therefore we must feed more than that or our efforts will be wasted.

It has been proven by experiments that a hen must be supplied with an abundance of protein because the egg contains more protein than is contained in the most common grains as corn, wheat and oats. Further it has been proven that the hen can use animal protein better than vegetable protein in making eggs. Therefore in compounding our laying rations we must supply a sufficient amount of animal food from which the hen can get the protein to go into the egg. The most common of these feeds which is produced on the farm is milk. It can be fed sweet or sour and as skim-milk or buttermilk one essential is that it be fed in the same state at all times and not sweet one day and sour the next. The exact amount of these to feed depends on the quality of the milk. A larger amount of skim-milk should be fed as it contains more water and not as much food nutrients as the buttermilk. If milk is not available there are several commercial animal feeds that will take its place. The most common of these is meat scrap, which is a by-product of the packing industry and usually contains from fifty to sixty per cent protein. Fresh meat scrap can also be obtained from local butchers at times and is an excellent food if it is in the right condition, but precaution must always be taken in feeding fresh meat, not to feed any that is spoiled for in doing so there is much danger of causing sickness which would

retard the egg production and in some cases kill the hens.

Some form of green food must be supplied as the health of the bird depends very much on the green feed she receives and a hen in poor health will not produce eggs. This can be supplied in various forms and the most common is the sprouted oats. Oats can easily be sprouted by placing a thin layer in a box and sprinkling with warm water two or three times each day. Clover or alfalfa leaves also make excellent green feed and can usually be found on the farm. There are also other less common feeds as mangles, sugar beets, cabbage and turnips which can be stored and used in the winter to a good advantage.

Grit should be furnished at all times as the hen must have a supply of grit to grind her food. It has also been thought by some that the hen uses certain parts of the grit as food but whether this is true or not we know that grit is essential. This can be supplied either in the form of fine gravel or sand or by some commercial grit. It should be kept where the hens can get it at all times.

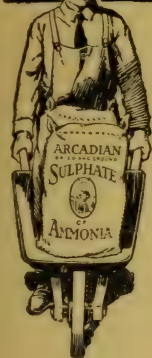
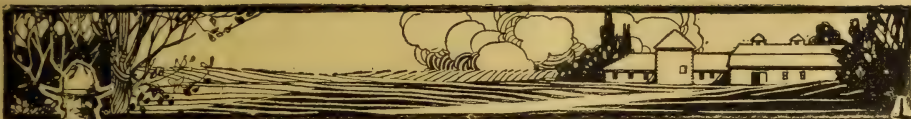
There must also be some form of good from which the egg shell is made as the grains fed do not contain enough lime for this purpose. This can be supplied by using some kind of sea shells and especially oyster shells. The egg eating habit is often caused by a scarcity of lime or egg shell material in the ration. This feed should also be kept before the birds at all times.

In considering what ration to feed the above points must be observed. The following ration as used by Purdue University will give excellent results of fed properly.

Grain.		Mash.	
Corn.....	18 lb.	Corn meal.....	5 lb.
Oats.....	7 lb.	Bran.....	5 lb.
		M. Scrap.....	3½ lb.

If skim milk is used fifty pounds will be equal to the three and one-half pounds meat scrap. We have in this ration twenty-five pounds grain and thirteen and one-half pounds of mash which should be

(Continued on page 166)



TOP DRESSING TALKS, No. 2

Fertilizer Bulletins Free—

We would like to tell you about ARCADIAN Sulphate of Ammonia; why it is the great American ammoniate; why it is the best top dressing for any crop that needs nitrogen; and how to use it most profitably.

Write for these instructive and interesting free bulletins and we will send them. Order by number. Address The Barrett Company, Agricultural Department.

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Sulphate of Ammonia is the well known standard article that has done you good service in your mixed fertilizers for years past.

ARCADIAN is the kiln-dried and screened grade, made fine and dry for top dressing purposes. Ammonia 25 $\frac{1}{4}$ % guaranteed. Made in U.S.A.

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AGRICULTURAL DEPARTMENT, NEW YORK

Horticulture Motorized

By Albert W. Heine, '20

IN these times of high priced and uncertain labor, the horticulturist, the most highly specialized of all agriculturists, must needs find some other source of power. Modern improvement manufacturers are now meeting this situation.

The power farming business has been growing by leaps and bounds during the past few years and it is only in the natural sequence of events that horticulture should become motorized. No branch of agriculture requires so much labor per unit of area than does fruit growing or vegetable gardening and for this reason there is greater opportunity for manufacturers in this field than any other.

Heretofore the vegetable gardener has done practically all his cultivation by hand, after the ground was plowed, because garden crops must be carefully tilled to get the best results. They cannot be handled as a field crop and cultivated like corn, to get good yields. So the gardener could not use the ordinary tractor, after his plowing was done or even a two horse cultivator. But the manufacturer saw this need and filled it with an entirely new type of tractor, "The one horse tractor; or the garden tractor."

The general design of this type of tractor is about the same. They have two wheels, the drivers in front. These support the weight of the tractor, thereby giving it a high per cent of traction. For the other two wheels the implement is used. The motors are usually four cylinder with two to four horse power. One of these tractors has six horse power, on the hilt, and three on the draw-bar, being the largest of the type. Practically all of the machines have belt pulleys and are made so that they may be used as stationary gasoline engines as well as tractors.

Steering is done in a rather unique fashion, compared to other types of tractors. Instead of the conventional steering wheel and shaft they have handles, resembling plow handles, which are used for controlling the tractor, steering and guiding the implement.

One might suppose that in turning, the

operator would have to carry the weight of the entire implement around to make it head in the opposite direction, but this is not the case. The maker has provided for turning in a rather unique fashion. A double clutch system is arranged whereby one wheel will turn while the other remains stationary, allowing the outfit to spin in a circle. These clutches are controlled by finger levers on the handles, one on either side. This is the complete steering apparatus and is the easiest to control of any ever invented.

With most of these outfits one man will do the same amount of work in a day as four men would with hand implements. The speed at which they operate is described in the slogan of one manufacturer which reads, "More than a yard a second—six inches deep." This is not only faster, but deeper than the hand implement is operated. The cost of operating these tractors is very slight, averaging only a few cents per hour for fuel. The price runs from \$150 to \$385, depending somewhat on the size. The first tractor of this type was the Beeman gasoline tractor, which was quickly followed by many others, some of which are the Midwest "Utilitor," the new Britain tractor, the "Merry Garden Auto Cultivator," etc. All the above mentioned machines are of the standard two wheel design and have proved very satisfactory in practical use, having been used for plowing, harrowing, discing, dropping, seeding, cultivating, spraying and for any sort of belt work requiring power not above their rating. On estates they are also used for pulling lawn mowers.

Long before the garden tractor was invented the orchardist was using motor power successfully in his operations. Those fruit growers who follow clean culture methods find tractors almost indispensable in their work, especially the small caterpillar type. The implement can be hitched so that it runs next to the trees while the tractor runs in the middle of the row. The tractor is only about half as high and half as wide as a team

(Continued on page 168)



A Gateway—Electrical

ONLY a forty-foot gateway bounded by two brick pilasters and ornamental lamps, but unlike any other gateway in the entire world.

For back of it is the General Electric Company's main office building, accommodating 2300 employees. And just next door is its laboratory with the best equipment for testing, standardizing and research at the command of capable engineers. Then down the street—a mile long—are other buildings where everything electrical, from the smallest lamp socket to the huge turbines for electrically propelled battleships, is made by the 20,000 electrical workers who daily stream through.

What a story this gate would tell, if it could, of the leaders of the electrical industry and business, of ambassadors from other institutions and from foreign lands.

The story would be the history of electric lighting, electric transportation, electric industries and electricity in the home.

This gateway, as well as the research, engineering, manufacturing and commercial resources back of it, is open to all who are working for the betterment of the electrical industry.

Illustrated bulletin, Y-863, describing the company's several plants, will be mailed upon request. Address General Electric Company, Desk 43, Schenectady, N. Y.

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MOSES FELL ANNEX.

Through the generosity of Moses Fell Dunn and Antonette Fell, of Bedford, Ind., Purdue University received a three hundred and sixty (360) acre farm in Lawrence county in March, 1914, to be used for experimental and investigational purposes to benefit the agriculture of Southern Indiana, and to be known as the Moses Fell Annex.

The farm is quite rolling and had a fifty acre orchard on the more level parts of it, but more than one-half of the trees had died of neglect and had to be replaced with young trees. The balance of the farm was covered with weeds and brush.

Since 1914 the orchard has been renovated and improved and the yield of apples has increased from 800 bushels, as reported by Mr. Dunn, to nearly 6,000 bushels last year. Land has been cleared for farming, soil fertility studies established and general farming developed as rapidly as possible.

Forty-four lines of investigation have been in progress bearing on some of the most important problems affecting farm management in southern Indiana. This work involves the uses of lime, legumes, various fertilizers and drainage in soil improvement work, variety studies of small grain, various methods of orchard management, spraying, etc., all of which are contributing valuable information of a most practical nature.

Corn yield varying from 23 bushel per acre on untreated plots to 64 bushels on plots receiving lime, manure and phosphorus.

Alfalfa is being grown under different treatments and variety studies of small grains and legumes are contributing interesting information.

A new house for the local manager, Mr. Frank I. Odell, has been erected, a water system for spraying work has been installed and necessary roads have been built in addition to the general improvement work done on the farm.

Crop production has been increased so satisfactorily that it is now possible to begin the production of livestock on the farm. Pasture improvement work has been commenced and will be carried along so that much important data may

be had on the methods of improving pasture and the carrying capacity of various grass mixtures.

FIFTH ANNUAL PURDUE APPLE SHOW.

Farmers' Week, January 12-16, 1920, will mark the time of the fifth annual apple show at Purdue. Last year, due to war conditions, no competitive show was held, but this year the show will be renewed, with redoubled pep and energy.

The exhibits will be divided into four classes, the Commercial Growers' Exhibits, High School Students' Exhibits, Horticultural Students' Exhibits and Horticultural Students, not specialists in pomology, exhibits.

For class sweepstakes a silver loving cup will be awarded in each class. The regular awards will be a first and second prize in each sub-class of varieties and a first and second prize for the best exhibit of all varieties.

Some special classes will be arranged, including one for faculty and a class in judging fruit. For each of these a silver cup will be awarded.

Students desiring to show fruit should make their selections as early as possible and put them in storage until the show. Nothing but Indiana grown fruit will be shown.

PURDUE APPLE SHOW.

The fifth annual Purdue apple show will be held Farmers' week, January 12 to 16, 1920.

There is a class for every one and a great many entries are expected. The exhibits are classified according to the following:

Class I. Commercial Growers' exhibits.

Class II. High School Students' exhibits.

Class III. Horticultural Students' exhibits (Specialists in Pomology.)

Class IV. Horticultural Students' exhibits (Not Specialists in Pomology.)

Class V. Purdue Students' exhibit.

Class VI. Apple and Fancy Pie exhibits.

Remember that this is not merely a local affair and if you are interested write for a premium list.



NOTE:

We want the public to understand that our plows are *NOT* the Case plows made by the J. I. Case Plow Works Co.

Why You Should Choose Machinery Built by the J. I. Case Threshing Machine Company, Bearing the Famous Old Trade Mark of the Eagle on the Globe.

If you could be here in Racine, and could spend a week going through our great shops, you would learn some things that would open your eyes to the superiority of the entire line of machinery we manufacture.

Because of our great output, we are able to buy better quality of steel for the same price that lower grades of steel would cost in smaller quantities. This means greater strength and longer service to you.

Because of unusual manufacturing facilities, we can and do use drop forgings in hundreds of places where a casting might "get by,"—and might break. We protect you from taking the chance.

Holes for bearings in Case Kerosene Tractor main frames are bored and reamed in one operation by a special machine. Bearings can never shift from their proper positions. The frame can never twist or warp.

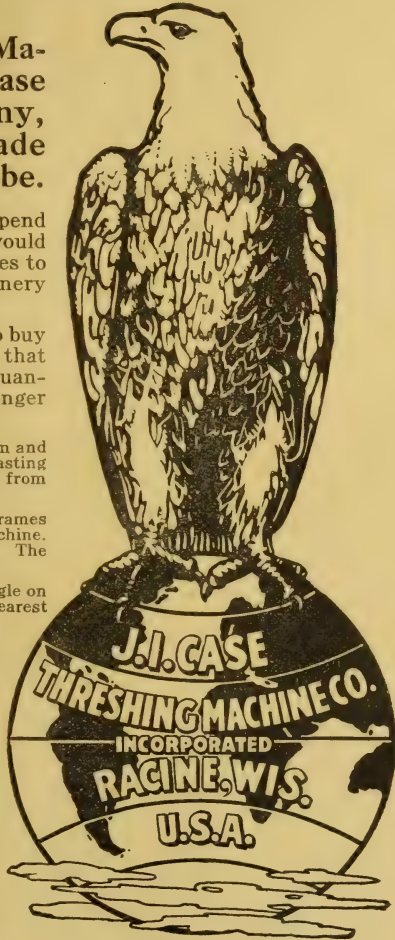
Case machinery, bearing the trade mark of the Eagle on the Globe has many other advantages. Ask the nearest Case dealer to point them out to you on

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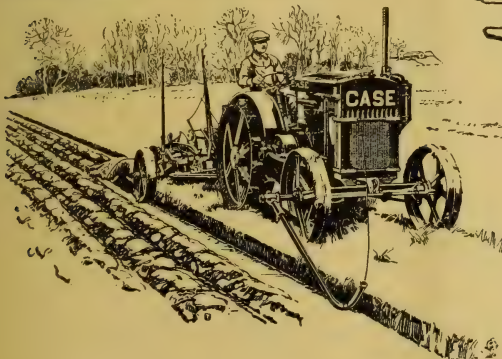
J. I. CASE THRESHING MACHINE COMPANY, Inc.

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Making Superior Farm Machinery since 1842



Look for the EAGLE. Our Trade Mark



To avoid confusion, the J. I. CASE THRESHING MACHINE COMPANY desires to have it known that it is not now and never has been interested in, or in any way connected or affiliated with the J. I. Case Plow Works, or the Wallis Tractor Company, or the J. I. Case Plow Works Co.

Judging Milk and Butter

By B. E. Horrall, '21.

PREVIOUS to the advent of the creamery, there was no systematic grading of dairy products. In fact, at the present time there is no universal system although practically the same score cards are used throughout the country. Before the inauguration of a system of scoring contests dairymen quite frequently asked if they could send a sample of their butter or milk to be scored at the various dairy meetings. Such inquiry and interest shown at the annual milk and butter shows held by the State Dairymen's Associations brought about a necessity for a systematic method of scoring dairy products and of showing them how to improve milk and butter.

The scoring of butter and milk is of value to the producer because, first, the average results obtained from scorings at different seasons of the year will let him know just what quality of milk or butter he is putting out. Second, it encourages him to produce better and cleaner milk because no man is satisfied with his methods if errors are pointed out to him. This means a better class of market milk that in general will command higher prices. Third, it will promote more careful work on the part of some inspectors and thus will protect the interest of the producer.

Milk

Milk is judged on bacterial content, flavor and odor, visible dirt, fat, solids not fat, acidity, bottle and cap. The

flavor and odor, visible dirt, bacterial content, fat, bottle and cap are of vital interest to the farmers, for they have control over these factors.

If consumers are served with an unpleasant flavored milk, they will either use less of it or will seek some other place to secure their supply. Flavors are scored by tasting the sample. The most common off flavors and odors found in "contest" milk and cream are those produced by certain feeds and by absorption of foul odor from stale air.



A good package in which to ship butter.

Visible dirt is found in the bottom of the bottle after letting it stand for half an hour or so. This dirt is a mute indication of carelessness somewhere between the cow and the consumer. Freedom from visible dirt does not mean that the milk is clean, but the presence of sediment does mean that not only was dirt allowed to fall into the milk but that little care was taken to strain it out.

Bottle and cap are scored according to appearance. The bottle should be clean, not chipped, and no metal parts should come in contact with the milk. The cap should be put in smoothly and tightly so that no water or dirt can get into the milk. It very often happens that the caps are placed very hastily in the bottles or are not of the proper size thus giving

(Continued on page 158)

Nunnally's

The Candy of the South

Every Box a Treat of Delicious
Sweets. We Carry a Com-
plete Line.

University Pharmacy

305 State St., West LaFayette

Natco Dairy Barns Are Warm in Winter

NATCO barns are warm in winter, yet cool in summer. They provide year-round comfort for your cows. More comfort in the stable means more milk in the pail—more money in the bank.

The hollow spaces in a glazed Natco Hollow Tile wall provide a blanket of still air through which heat, cold or dampness will not pass.

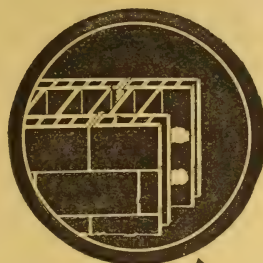
And the cost? Perhaps a little more at first, but *far less* in the end than for other construction. The saving in insurance and upkeep will repay the added investment within a few years. All further savings are clear profit.

Whatever you intend to build, our book, "Natco on the Farm," will offer helpful suggestions. Write for it today—*no charge*.

Ask your building supply dealer to quote you prices on Natco Hollow Tile.

National Fire Proofing Company
1220 Fulton Building
Pittsburgh, Pa.

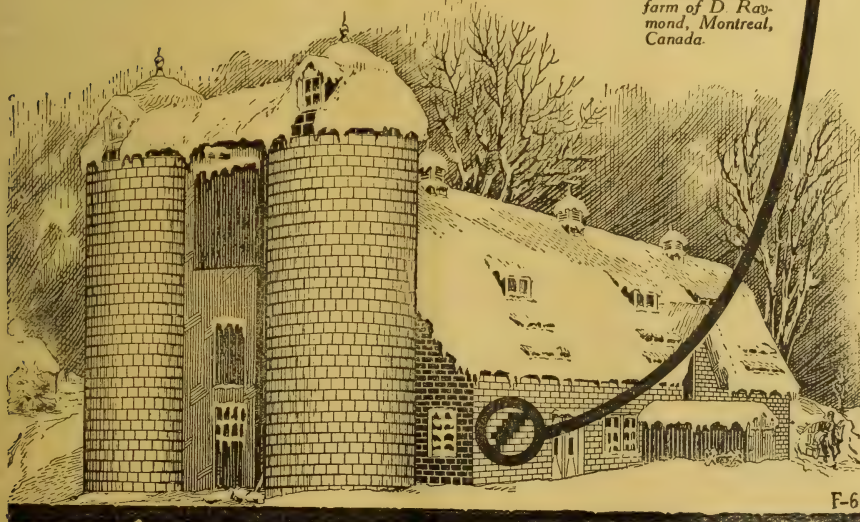
23 Factories assure a wide and economical distribution.



Section of Natco Wall showing still air spaces.

What do you intend to build? One of our farm building plans may help you—*free* while they last.

Barn and Silos on farm of D. Raymond, Montreal, Canada.



F-6

Alumni and Local

INJURED SOLDIERS AT PURDUE.

Thirty-five men who were disabled while in military service in this country or in France are enrolled in Purdue University this year and their expenses are being paid by Uncle Sam. Their coming to the university was arranged for by the Federal Board for Vocational Education which has charge of the rehabilitation of disabled soldiers.

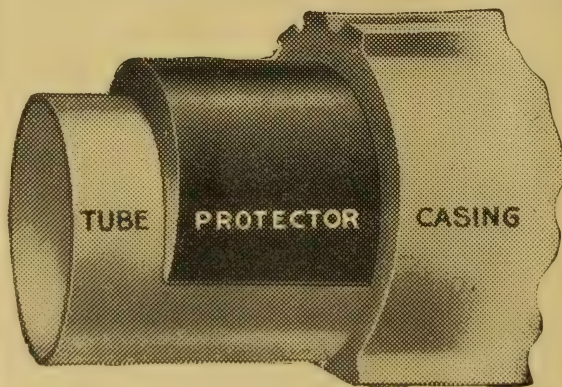
Of the thirty-five men, twenty-eight are in a university for the first time, while of the seven who have been at Purdue before, five are sophomores, one is a senior and the other is taking post graduate work. Twelve of the men are taking agriculture with the expectation of either being able to farm for themselves or take agricultural positions when they have completed their work. Eight are taking electrical engineering, four civil engineering, seven mechanical, two chemical and one each is enrolled in the science and pharmacy courses.

Most of the men were either wounded or gassed while in action overseas and many of them have been out of school for some time. Several of them held commissions in the army and the list includes several former lieutenants and captains and a number of non-commissioned officers.

Most of the men are taking special courses, and despite the handicap of being away from studies for some time, are experiencing little difficulty in getting into the "harness." Major E. G. Byers has charge of the men and they report regularly to him.

L. M. Busche, '19, is at Monroe, Ind., teaching mathematics and agriculture in the high school.

J. C. Hackleman, '10, is now instructor in the Soils Department at the University of Illinois.



COUNTY AGENTS

We have a few counties left which can be had by live-wire men that are in a position to produce.

Our Protectors will always pay big dividends to you and your customer.

IT WILL COST YOU NOTHING TO INVESTIGATE!

Coffield Tire Protector Company OF INDIANA
304 N. CAPITOL AVE. INDIANAPOLIS, IND.

Coffield Tire Protectors are the talk of the State

The COFFIELD TIRE PROTECTOR Means Perfect Tire Protection because—

NO MORE STONE BRUISES. The Protector Cushions and Distributes the Blow.

NO MORE PUNCTURES. The Coffield Tire Protector eliminates 95% of all Punctures. PREVENTS BLOWOUTS Due to Inflation.

EASIER RIDING is the first noticeable feature after the Protectors are used.

Wherever
Oliver plows are
used
the results of
good plowing are
plainly
in evidence

**Oliver Chilled Plow
Works**

Plowmakers for the World

South Bend, Ind.

Indianapolis, Ind.

Oliver



J. H. Weghorst, '19, has been recently employed by the De Graff Canning Co., De Graff, Ohio. His position is that of agricultural advisor and his chief duty is that of improving their strains of sweet corn.

IVAN S. GLIDEWELL
Spotted Poland Hogs

VERA H. GLIDEWELL
White Rock Chickens

Sunny Brook Stock Farm

PLAINFIELD, INDIANA

Feeding of Texas Bred Hereford Baby
Beeves a Specialty.

The Varsity

Rapid Shoe Repair Shop
guarantees finest workman-
ship and perfect satisfaction

Jacob Bossung

302 State Street. West LaFayette

LaFayette Milling Co.

Manufacturers of the following
brands of fine

FLOUR

"LAFAYETTE MILLING CO.'S
BEST"

"SILVER MOON"

"WEDDING CAKE"

"SNOW FLAKE"

Purdue State Bank

STUDENTS' ACCOUNTS
SOLICITED

FARMERS' SHORT COURSE AT PURDUE JAN. 12-16.

The annual Indiana farmers' short course will be held at Purdue University January 12 to 16, 1920, according to announcement by university officials. Committees have been named to arrange the various details of the course and the largest attendance in the history of farmers' weeks at Purdue is anticipated. Speakers of national reputation will be on the program. Plans will be made to care for 3,000 farmers and their wives.

In addition to the short course, the annual Indiana Corn Show will be held throughout the week at the university and the twentieth annual meeting of the Indiana Corn Growers' Association will be held one day of the meeting. The Indiana State Dairy Association, its allied organization and the various beef cattle clubs will hold their meetings during the same week.

The short course will be in addition to the other short courses in poultry husbandry, tractor operation, telephone operation, and the regular eight weeks' winter course in agriculture.

Announcement also was made that no plans would be made this year for the boy and girl club winners during the short course, but that they would be brought to the annual club round-up which will be held next spring. This change was made this year because the club round-up held last spring was so successful.

PURE BRED CALVES GIVEN TO ORANGE COUNTY BOYS.

The first pure-bred calf club has been formed in Orange county and twelve registered Jerseys, purchased in another state by breeders in that county, have been distributed to a dozen boys and girls. The calves cost the members an average of \$112 each. The youngsters organized their own club, selected officers and started on their year's work.

R. D. Kauffman, '17, and R. H. Schreiber, '17, are both instructors in the department of Agricultural Extension at Ohio State.

That which costs little is of little worth.

DELCO-LIGHT

"Electricity for every Farm"

The Delco-Light engine is the **valve-in-the-head** type—used in the best and most powerful airplane engines and in hundreds of thousands of automobiles.

It is air-cooled—runs on kerosene in any climate—has only one place to oil and has a simple mixing valve in place of carburetor.

The storage battery is exclusively designed and built for Delco-Light with thick plates, wood and rubber separators and many improvements that insure long life.

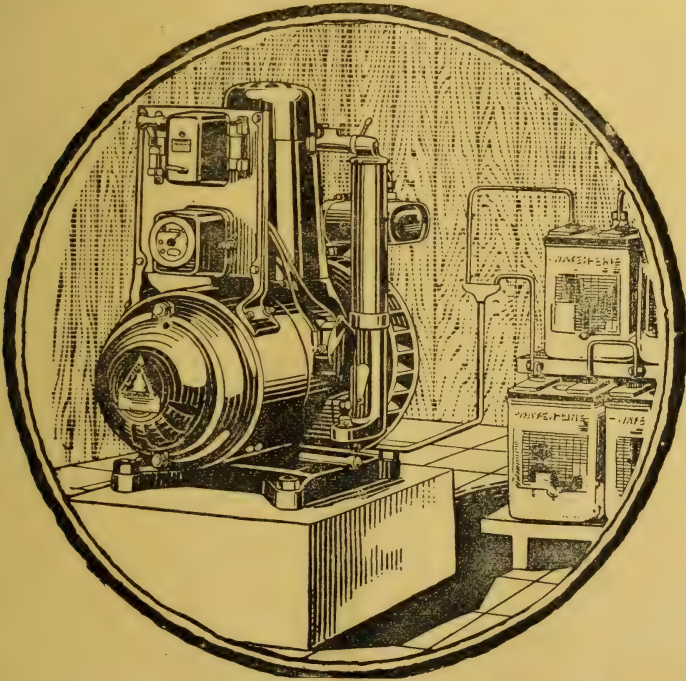
Delco-Light long ago passed the experimental stage and has gone through the refining influence of three and one-half years of production and of usage by 75,000 customers.

You will find plants in the homes of your community. Just ask your neighbor about his Delco-Light plant.

Delco-Light makes happy homes; it saves time and labor, taking away lots of hard, unpleasant tasks. It "Pays for Itself" by the work it does and the time it saves.

Of the more than 75,000 Satisfied Users of Delco-Light, the first are among the most enthusiastic—proof that the simplicity and durability of Delco-Light meets the requirements of its customers.

Over 2,500 sales and service representatives throughout the country. There's a Delco-Light man near you.



Delco-Light is a complete electric light and power plant for farms, country homes, schools, churches, stores and small towns.

THE DOMESTIC ENGINEERING COMPANY

Makers of Delco-Light Products, DAYTON, OHIO

E. L. KRUSE, Distributor, 58 to 64 W. New York Street, Indianapolis, Indiana

"LaFayette"

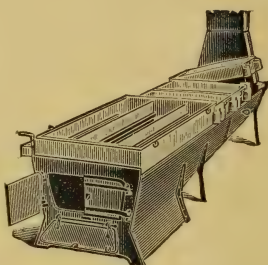
HOMINY FEED

Corn Meal
Hominy
Grits
Corn Flour, Etc.

LAFAYETTE CORN FLOUR MILLS

LAFAYETTE, IND.

SAVE YOUR MAPLE TREES



There is a greater demand for Maple Syrup and Sugar than ever before. The CHAMPION EVAPORATOR saves Labor and Fuel, and MAKES BEST QUALITY SYRUP, giving BETTER RETURNS FROM YOUR SUGAR BUSH.

Write for catalogue and terms, stating number of trees you tap. Sugar Makers' Supplies of all kinds. ORDER EARLY.

CHAMPION EVAPORATOR COMPANY

HUDSON, OHIO

BASKETBALL SQUAD HAS BRIGHT OUTLOOK FOR COMING SEASON.

Twenty candidates have answered Basketball Coach Ward Lambert's call for the 1919-1920 team aspirants and work for what is expected to be one of the most successful seasons that the Boilermakers have enjoyed in several years has been started.

Prospects Good.

What makes the prospects appear brighter is the fact that there are six basketball "P" men in school, five of whom will be eligible to play with the team. These men are Church, captain and floor guard of the 1917 team, Coffing, back guard of the 1918 team and captain elect of the 1919 team, M. M. Smith, floor guard of the 1918 team, Tilson, forward on last year's team and Campbell, last year's center.

In addition to these men, Lambert has a number of other capable candidates in such men as White, Hurley, Miller, McConnell, Haigis, Foresman, Wagner, Monical, Dietrich and Klinesworth. These men are former members of past year squads or of last year's freshman varsity and will give "Piggy" a wealth of material from which to select his team.

H. L. Royce, '17, county agent of Wabash county, is the father of a new baby girl named Virginia Louise.

John Olmstead, '18, is farming with his brother near Evansville. They were formerly in the dairy business, handling Holstein cows, and are now getting into the Duroc Jersey hog business. Mr. Olmstead recently collected a great deal of data that showed the greater effect of lime on light soils than on heavy soils.



Apollo

Roofing Products

Highest quality—
Sold by weight

Why build to burn? Use Galvanized Roofing for farm buildings—Tin Roofs for residences.

APOLLO-KEYSTONE Galvanized Sheets not only excel for Roofing and Siding purposes, but are specially adapted for Culverts, Tanks, Spouting, and all exposed sheet metal work. KEYSTONE COPPER STEEL Roofing Tin Plates are unequalled. Sold by leading dealers. Look for the Keystone added below regular brands. Shall we send our "Better Buildings" booklet? AMERICAN SHEET AND TIN PLATE COMPANY, Frick Bldg., Pittsburgh, Pa.

INDIANA

A Dumping Ground for Seed Men

WHY SHOULD IT BE?

For Heaven's sake, let's get together and put over a

PURE SEED LAW

Are YOU with me?

If so, I want to hear from you, for I started that way and I want your help. We have a good Feed Law, so why not a Seed Law?



And, by-the-way, I handle

SEEDS *and* FEEDS

Write for Samples and Prices—I can save you money.

Let me send you my Big 1920 Catalog FREE. Write me today.

DAVE PECK SEED COMPANY

DAVE PECK, Pres.

3rd Ave. and Penna. St.

Evansville, Ind.

A Higher Ideal

There would be no advantage in devoting the most valuable years of one's life to gain knowledge and experience, if greater possibilities and achievements were not forthcoming.

It is then proper to assume that because of his exceptional scientific training the agricultural college man is progressive, well advised in the most modern dairy practices and the methods that are likely to make dairying the most profitable.

You know that profitable dairy production cannot succeed without cleanliness, and you should also know that



is capable of maintaining a cleanliness that is productive of the highest quality dairy products, because it is used for thorough and sanitary cleaning by all Agricultural Colleges in the United States and Canada.

Ask your supply man to fill your order. It cleans clean.

Indian in
circle



in every
package.

THE J. B. FORD CO.,

Sole Mnfrs., Wyandotte, Mich.

4,256 SLACKER HENS ARE FOUND IN INDIANA FLOCKS

Purdue Men Culled 22 Per cent, Over
Fifth of Biddies, in Recent Culling Campaign.

Twenty-two per cent or 4,256 hens in the poultry flocks on Indiana farms were found to be slackers and were discarded by poultrymen of the Purdue University Extension Department in the culling campaign which they conducted during August and September, according to the figures which are contained in the final report of their work. During the two months that the campaign was going on, the men conducted 214 demonstrations in 56 counties and handled 16,068 hens.

That the culling brought results and weeded out the hens that were non-producers is shown by the fact that a week after the culls had been taken out of the flocks, the egg production of the entire number was only reduced by 1,880 eggs or six and one-half per cent of what it had been before the 4,256 slackers were discarded. The poultrymen figured that the average flock consisted of 115 hens and that the average decrease in the number of eggs was only 14 for the week or two each day. The culling has saved many tons of feed.

Four men in the Poultry Division were engaged in the culling work this year and gave two demonstrations in each county that asked for them. The farmers who attended these meetings were able to go home and cull their own flocks and as a result of the work done, thousands of the non-producing hens in the state were sent to the block.

SPECIAL COURSE AT PURDUE.

The annual winter short course will be held this year at Purdue University, December 29 to February 27. Those taking this course will get the benefit of the farmers' short course beginning January 12. The eight weeks' course will be suspended during the farmers' week, and the students will attend the farmers' short course program.

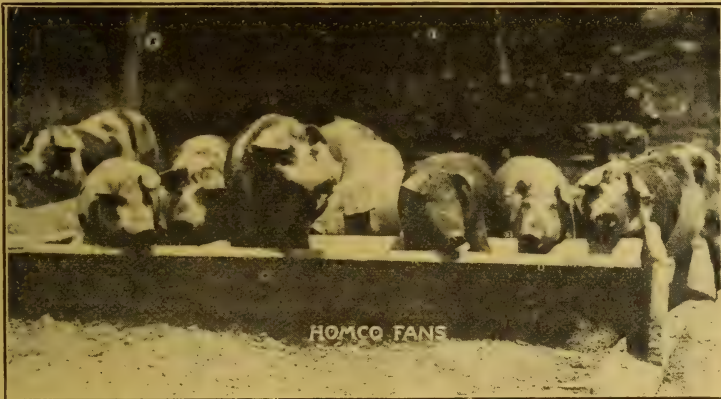
The plan of study of the winter courses gives the student a choice of four general courses as follows: General Agriculture, Animal Husbandry, Commercial Dairying,

HOMCO PIG AND SHOAT FEED

Pigs root for elements essential to growth that are not always present in the soil.

HOMCO Pig and Shoat Feed is a highly concentrated ration to the degree of furnishing in natural form elements necessary to rapid construction of a big well-covered frame.

HOMCO Pig and Shoat feed insures a short feeding period and minimum shrinkage in shipping. Each ingredient an ideal pig feed if fed alone. Write us for sample.



A Complete Balanced Ration Developing Feed. For Brood Sows, Pigs and Shoats. Write for Sample. "Homco" means Quality. Quality means Economy.

American Hominy Company

Indianapolis, Indiana.

HAYWOOD PUBLISHING COMPANY

LaFayette, Indiana



If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

and Home Economics. The winter course comes at a time when there is a lull in the farm operations and judging from the interest shown in previous courses a large enrollment is expected this year.

JUDGING MILK AND BUTTER.

(Continued from page 148)

a very bad appearance. With a little care in capping bottles the appearance and salability of the milk will be greatly increased. The producer can greatly lower the bacterial content if special care is taken in cleaning the utensils with which the milk comes in contact.

Butter.

Butter is another dairy product in which the dairyman is interested. Butter is scored on flavor, body, color, salt and package.

Flavor is seldom given a full score. Many off flavors are due to old cream, poor milk or perhaps to absorbed flavor such as barny or cowy odors. The very undesirable flavors are dirty, distinct old cream and very strong butter, musty or stale. The flavors are due to what the name of the defect indicates, as, old cream flavors which is due to letting the cream stand too long before churning.

The body of butter should be waxy and firm. This factor, however, is not as important as flavor. A greasy butter will not sell as well as a firm and waxy butter.

The color of butter is regulated by the community in which it is made. If the community likes a rich yellow colored butter it will be necessary to make butter of a rich yellow color. The regulation color of butter is a light yellow, uniform in appearance.

Salt content of butter must be made to satisfy the consumer; therefore the dealer in butter must be strict so far as salt is concerned. The package must have a neat appearance and the lining must be free from wrinkles and be clean.

The producer therefore should not only be encouraged to enter his milk and butter as an exhibit at a show of dairy products but also to take more interest in trying to produce cleaner milk and better butter. This in turn encourages the consumer to pay more for better products.

Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

ACME-EVANS COMPANY

Indiana's Largest Millers

INDIANAPOLIS, IND.

Salesmen, Agents, Jobbers and Wholesalers Wanted

Exclusive territory city or county. Coal shortage a crisis. Getting worse. Most perfect burner for cooking, heaters, ranges and furnaces. Generates gas from common oil. Not an oil burner. Intense in heat. Substantial, economical, no dirt. Retail complete outfit, \$15. Easy to install. Millions must have. Agents coining gold. Quick.

Hot Blast Oil Gas Burner Syndicate

221 INDIANA AVE., INDIANAPOLIS

RESOLUTIONS ADOPTED BY AMERICAN FARM BUREAU FEDERATION AT ITS ORGANIZATION MEETING, CHICAGO, ILLINOIS.

(Continued from page 122)

19. With few exceptions in the past forty years, the farmers' sole profit has come from unrestored fertility taken from the soil and from long hours of work and unpaid labor of women and children. We insist that these are legitimate factors in cost of Food Productions and must be so recognized by the commercial interests and general public.

20. We assert the farmer is entitled to a just profit on a cost of production on all products with these items properly accounted for—with due consideration to the hazardous risks he encounters and with a wage allowance for his own labor and ability commensurate to that received in other occupations.

21. We express our appreciation of the act of congress in repealing the so-called Daylight Saving law.

22. We believe Armistice day should be made a National and International

“MADE IN INDIANA”

Kingan's Digester Tankage

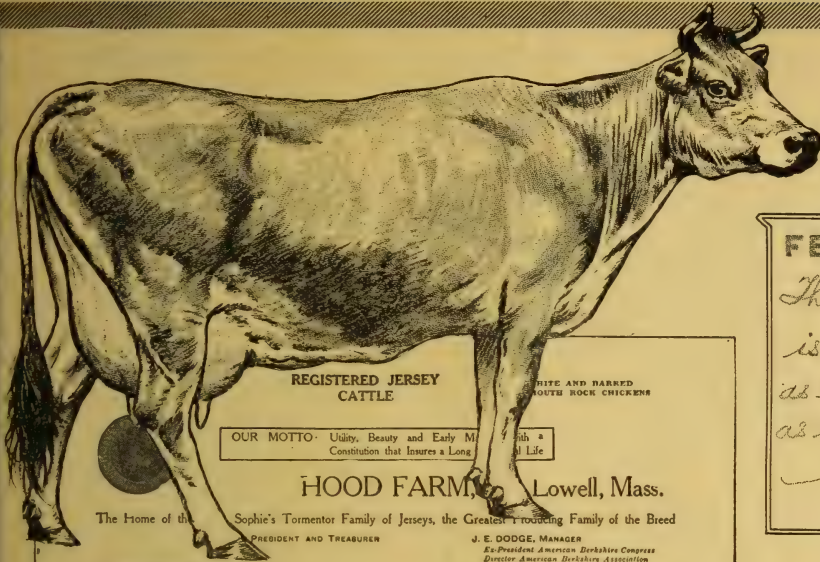
(HOG FOOD)

Manufactured in accordance with the Indiana Feeding Stuff's Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining “KINGAN'S” Digester Tankage of your dealer.

KINGAN & CO. LTD.

**BEEF AND PORK PACKERS,
INDIANAPOLIS, IND.**



REGISTERED JERSEY
CATTLE

WHITE AND BARRED
SMOOTH ROCK CHICKENS

OUR MOTTO: Utility, Beauty and Easy Milking
Constitution that insures a Long Life

with a
Long Life

HOOD FARM, Lowell, Mass.

The Home of the Sophie's Tormentor Family of Jerseys, the Greatest Producing Family of the Breed
PRESIDENT AND TREASURER

J. E. DODGE, MANAGER
Ex-President American Berkshire Congress
Director American Dairymen Association

All prices quoted are subject to sale or
advance without notice unless reserved.

Terms: cash with order in Boston or New
York funds. Cattle to be returned prepaid.

JED-ESW.

May 6, 1919.

Mr. R. P. Walden,
Corn Products Refining Co.,
17 Battery Place,
New York, N. Y.

Dear Sir:-

Yours of May 2nd at hand. I would state that as usual
in her former tests, Sophie 19th of Hood Farm consumed a large
proportion of Buffalo Corn Gluten Feed, ranging from three to
four pounds per day during the entire year. She is now at
fifteen years of age in perfect physical condition and is
due to calve in August, and we look for another large record
from her, showing that the feed she has consumed in past years
has done her no harm. It is safe to say she has consumed
while making her eight yearly records over six tons of
Gluten Feed.

Yours truly,

Hood Farm,

J. E. Dodge, Mgr.

FEED UP

*The Feeding
is every bit
as important
as the Breeding*



Made by

Corn Products Refining Co.
New York Chicago

HANSEN'S

Dairy Preparations

For cheese and butter making on the farm as well as in largest creameries and cheese factories, Hansen's preparations are standard. They are pure, concentrated, and simple to use.

Use Hansen's Rennet Tablets, Rennet Extract or Lactic Ferment Culture for cheese making (in the small dairy Junket Brand Buttermilk Tablets are used to advantage for cheese making).

Hansen's Danish Butter Color, and Hansen's Cheese Color are used in the finest creameries and cheese factories. Hansen's products are on sale at drug or dairy supply stores or sent direct.

"The Story of Cheese Making" by J. B. Frederiksen, free on request.

Chr. Hansen's Laboratory, Inc.

Little Falls, N. Y.

holiday and request proper national and international authorities to so act.

We suggest that since Thanksgiving is not an anniversary of the event commemorated and the date generally observed so near Armistice day that national and state governments legally fix Thanksgiving day coincident with Armistice day.

23. We are unqualifiably in sympathy with the government's determination to suppress radicalism and we lend our full support to all efforts to rid this country of Bolshevism and all other anarchistic tendencies.

We especially deplore the outrage committed at Centralia, State of Washington and we trust that our government has already taken firm steps to punish the perpetrators of this crime and to prevent any occurrence of like outrage on our flag and our citizens in the future.

He who is never satisfied with anything, satisfies no one.

It is because we have not learned to preserve that the work seems never to progress.

Multiplied Milk Profits

Pay less for feed. Yet get more milk.
There is a two way profit! You can have it as well as the thousands who are now getting it. Get it by the same method.
Feed


INTERNATIONAL

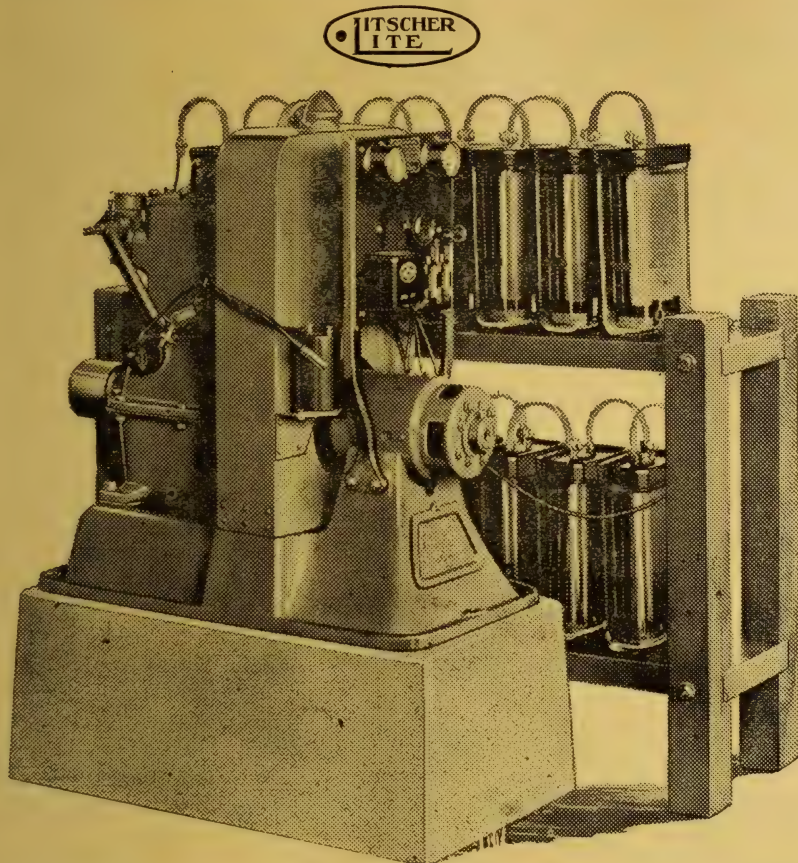
Special Dairy Feed

This famous ration is a far better milk producer than ordinary grain feed. It permits you to sell your home grown grains. In all these ways it saves and **makes** money for you — and gives you healthier, more contented cows. This is certainly milk profits multiplied.

Order a trial ton. Be sure it is International.
 Write us if not convenient to order from dealer
International Sugar Feed Co., Minneapolis, Minnesota







The **Litscher Lite** Plant is started by a push of a button, and runs on kerosene. One gallon of kerosene will run a **Litscher Lite** Plant for several hours.

The **Litscher Lite** Plant has two full H. P. in excess of its dynamo requirements. When the dynamo is idle, four H. P. are at your command for running any belt driven farm machinery. In other words the **Litscher Lite** Plant is an electric lighting plant and a stationary power plant combined.

Litscher Lite will operate electrically or by belt transmission any labor-saving device in house or barn.

The Varney Electrical Supply Co.

(INCORPORATED)

DISTRIBUTORS AND MANUFACTURERS

ELECTRICAL SUPPLIES

INDIANAPOLIS---EVANSVILLE

SEND TO DEPT. P. A. FOR BOOKLET AND SPECIFICATION SHEET—FREE

Quality Goods Direct From Factory



We save you money on Fence, Gates, Posts, Paint, Roofing, Tanks, Troughs, Fountains, Feeders, Tank Heaters, Silos, Metal Cribs, Wagons, Cultivators, Pulverizers, Harrows, Discs, etc.

Satisfaction guaranteed or money refunded.

Write today for FREE catalog.

STANDARD SUPPLY HOUSE

36 W. Logan St.

NOBLESVILLE, IND.

THE CARPET BEETLE, OR BUFFALO-MOTH.

(Continued from page 133)

sect. If the insect is found a good thorough laborious remedy is to place a damp cloth over the suspected spot and iron with a hot iron. The steam thus generated penetrates the carpet and kills the insects immediately beneath it.

Another effective method is to fumigate with carbon bisulphide. The vapor should not be inhaled and as it is inflammable there should be no fire in the house.

Hydrocyanic acid gas treatment has been used for several years and is the most effective remedy known not only for carpet beetles but also for all other household pests. This gas is deadly poison to the human being as well as to the lower forms of animal life and must be used with the greatest caution. Circular 163 Bureau of Entomology U. S. Department of Agriculture explains fully the use of this gas and should be studied carefully before the treatment is undertaken.

Palpitation of the heart is bad; of the mouth worse.

Reliable Heater Fountain

WARM WATER IN ZERO WEATHER

All feeders are agreed that plenty of fresh, warm water is essential to successful winter feeding of hogs.

Realizing this growing need we have equipped our famous **RELIABLE FOUNTAIN** with a lamp heater and are offering it to the trade under the same guarantee as our summer fountain. Made from very heavy gauge galvanized iron, has no valves or floats, nothing to get out of order.

Demand the best. Ask your dealer to get prices. Prompt delivery.

Crawfordsville Wire & Nail Co.

CRAWFORDSVILLE, IND.

MISTER FARMER!

*How long are you going to let Dobbin
eat profits from your wallet?*

Thomas Edison says: "A horse is the poorest motor ever built. He eats the output of five acres, and yet his thermal efficiency is only two per cent."

BUY A

FORDSON FARM TRACTOR

MADE BY

HENRY FORD & SON, Inc.

AND SAVE

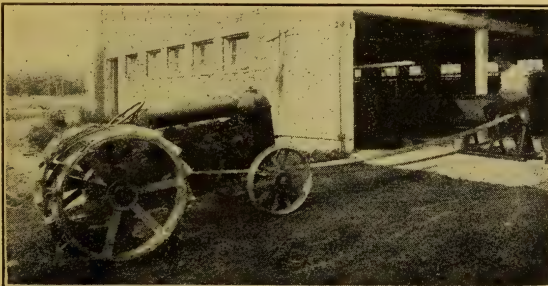
TIME, LABOR and MONEY

It is estimated that the horse works 100 days a year. The Fordson works the year round. Plan your work ahead.

FORDSON CALENDAR.

January Corn shelling, feed grinding, straw baling, wood sawing.	February Corn shelling, baling, feed grinding, wood sawing.	March Plowing, discing, rolling wheat, dragging roads, stump pulling.	April Plowing, discing, cultipacking, drilling, road building, manure spreading.
May Plowing, discing, cultipacking, harrowing corn.	June. Harvesting, hay loading and hauling, baling.	July Harvesting, threshing and hauling, hay baling.	August Clover hulling, threshing, plowing, discing, cultipacking corn.
September Drilling, cultipacking, silo filling, hulling clover.	October Plowing, seeding, baling, clover hulling.	November Corn shredding, fall breaking, feed grinding.	December Corn shelling, feed grinding, corn shredding, straw baling.

**SEE
YOUR
FORD
DEALER**



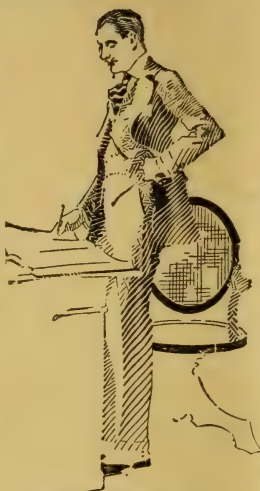
**The Fordson
Tractor
and the
Stover
No. 40 Feed
Mill
make a
fine
combination**



Suits and Overcoats

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See Our Windows.

THE HUB

B. & J. Hirsh

West Side Square

FEEDING LAYING HENS.

(Continued from page 142)

fed in the same length of time. The grain should be mixed and fed twice daily in the litter so that the hens will exercise by scratching for it. The mash should be fed in an open hopper and kept before the birds at all times. Besides these there should be supplied grit and shell in open hoppers and green feed once per day.

No ration, however, well it may be compounded or balanced will give good results unless it is fed properly; that is, the method of feeding has a great deal to do with the results. The vigor of the hen comes largely from her activity, and it is the vigorous hen that lays. It is by proper management and feeding that the hen is forced to take enough exercise and it is in obtaining this point where the individual feeder shows his skill.

Regularity is a point to be observed in feeding. A "feast and a starve" won't satisfy the laying hen. During the winter the hen should go to roost with a full supper to sustain her through the long night, and just as early as she can see to

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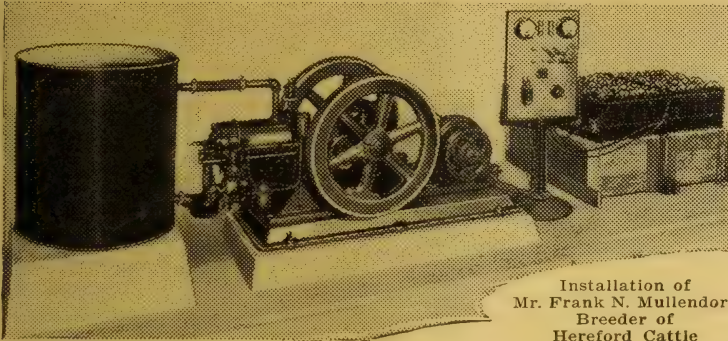
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eat in the morning her breakfast should be ready.

In summing up these points a prominent poultryman states it best in these words: "Feed wholesome food," feed liberally; feed regularly; feed a variety. After that, the only secret in feeding is to feed activity into the hen."

HORTICULTURE MOTORIZED.

(Continued from page 144)

and for these reasons does not injure the trees so much.

In vineyards the first tractor used did considerable damage by catching the vines in the front wheels, but now a solid disc front wheel is used, eliminating the trouble. For plowing close to trees or vines a sliding hitch is used to the plow so that it runs directly behind either the right or left drive wheel.

A unique implement has been introduced which is proving of value in the irrigated orchards of the west. This is a ditching attachment composed of two shovels, the required distance apart to dig two ditches at a time. The outfit travels about twice as fast as do horses

AGRICULTURAL LIMESTONE



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to your milking herd, two parts Schumacher and one part Big "Q," in the same amount you usually feed, together with ensilage or other roughage. After three or four days, begin increasing the amount 1 pound per cow at each feeding and keep increasing as long as each cow increases her milk production, until she has reached her maximum flow. Some of your cows will handle more feed than others. Watch the results on each individual cow and feed each cow to the limit—the increased milk production will repay you many times the cost of the additional feed. Mr. Fred Lehman, of Carlisle, Pa., proved that maximum feeding increased his profits \$85.30 during April from 4 cows.

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These feeds make feeding easy, economical and accurate. SCHUMACHER FEED (the carbohydrate ration) and BIG "Q" (the high quality protein ration) have unusual palatability, high digestibility and nutrition. Thirty-five World's Champion Dairy Cows have made their World's Records with these feeds—undeniable proof that they are the greatest dairy feeds in the world. Your dealer can supply you.

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and lays out straighter, more uniform ditches than is possible by hand or team.

Of course this is only the beginning of motorized horticulture, but the handwriting on the wall seems to indicate the end of the hand hoe and horse drawn implements in the equipment of the modern horticulturists' plant.

PIG CLUB PORKERS GET PREMIUM PRICE.

Twelve pigs fed by members of the Hanover Pig club attracted much attention at the fall festival recently at Madison because of the excellent record made by the youngsters in their feeding work. The pigs put on an average daily gain of 1.7 pounds. Their average weight at the start of the contest, May 10, was 30½ pounds and at the conclusion they averaged 286 pounds, the largest in the lot weighing 330. Robert Craig, a successful farmer of near Hanover, supervised the work of the boys, and County Agent Doddridge attributes much of the success to him. Because of the boys' work a packing company at Madison gave them \$16 a hundred, \$4 above market price, for their porkers.

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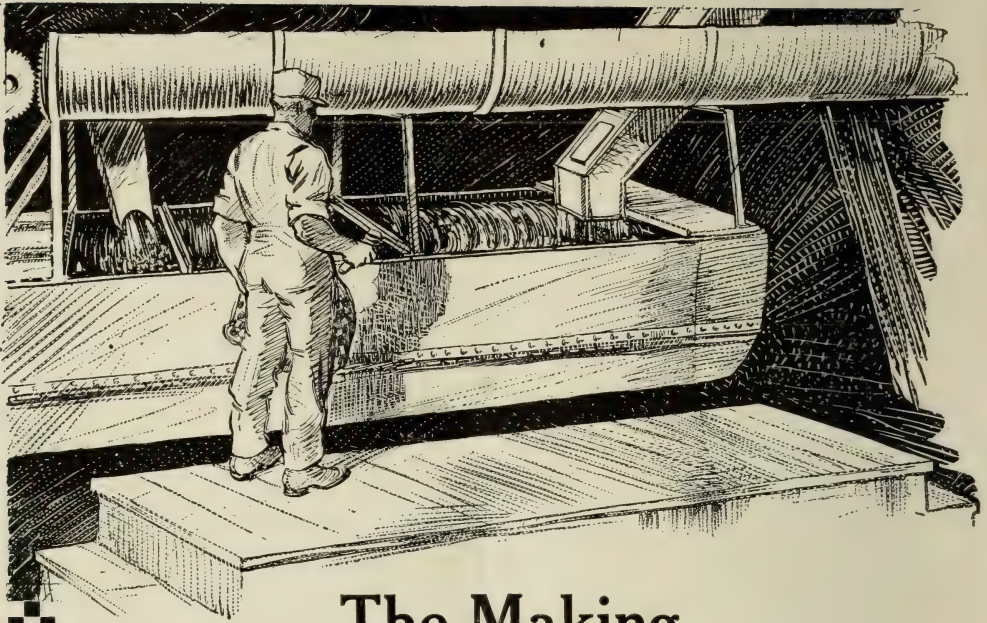
The PURDUE AGRICULTURIST



JANUARY, 1920



Vol. 14 No. 4



The Making of a Proper Milk Ration

Uniform quality through and through is what counts in making a milk ration. The milk-making elements must be distributed evenly throughout the feed if your cows are to be properly nourished at all times.

You can insure against the dangers of improperly mixed feeds and off-quality grains by adopting

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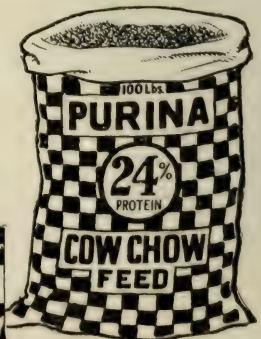
as your standard cow ration. Every ingredient in this perfectly balanced ration not only meets the test of quality, but is also distributed in just the right proportion to produce the best results in milk-making. Quality of ingredients, plus accurate measurement and thorough mixing, combine to produce a feed which increases a cow's milk flow and maintains it at a maximum.

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Serum and Virus

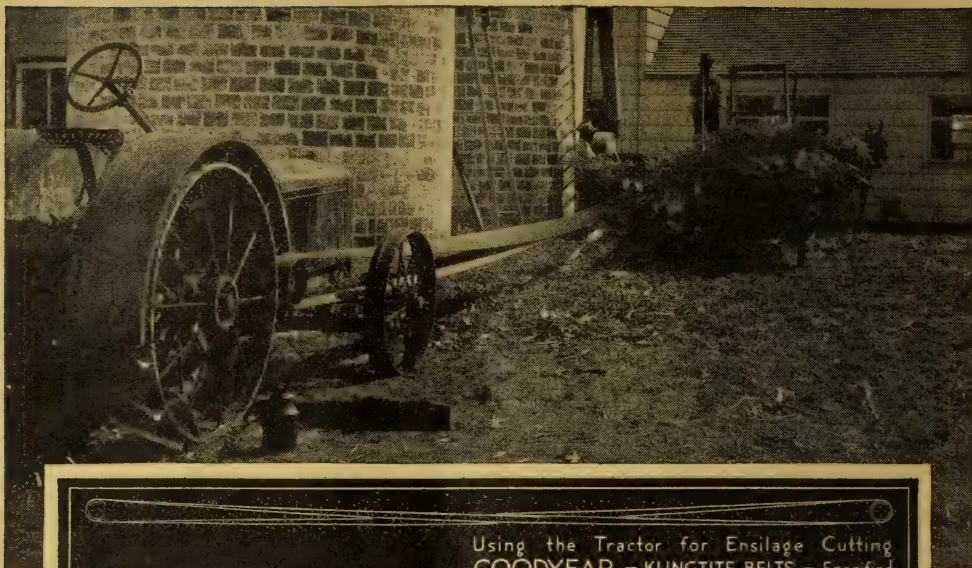
The Single Bled from the Swine Breeders Pure Serum Company saves your hogs. Experience has proven it to be **the best**. We can supply your wants at once.

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The present-day trend of farming is all in favor of power equipment. Machinery is doing the work that yesterday was the portion of human brawn and animal muscle, and successful farming has become very largely a matter of economical employment of power.

Belts play an important part in the modern economics of agriculture. Time spent in breaking in a belt, in re-setting an engine, in re-hanging of belting, is money lost—for to nobody is time worth more than to the farmer. Power wasted in transmission is loss of engine efficiency and fuel value. Engine bearings burned by poor belt action are an expense in time, money and labor, all three.

Contrast the advantages of Goodyear Klingtite farm belts. They need no breaking in; they require no dressing. They conform to the pulleys, run freely, and hold with the grip of a true friction surface. Proof against rain and dew, there's no engine re-setting where there's a Goodyear Klingtite.

An example of time saving is furnished by the performance of a 100-foot, 7-inch, 4-ply Klingtite Belt in use on the Rock River Farm, the McCormick estate at Byron, Ill. The foreman credits a gain of two days in filling the four 14 x 40 silos this fall over the time it took last year to the uniform, trouble-free action of this belt.

Goodyear Klingtite Belts are standard quality construction. Unstitched, they wear evenly. There is no separation at the plies, no drying out. They last longer than ordinary belts—and they cost but little more in the first place. They are obtainable in all lengths for every power need on the farm—wood-sawing, feed-grinding, threshing, pumping and lighting.

Students and teachers of agriculture may find much of interest and profit about the function of good belting on the power-equipped farm in the Goodyear Mechanical Goods Encyclopedia. A request by letter to the nearest Goodyear Mechanical Goods Service Station or to Akron will bring you one.

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THE farmer milks the lowing kine,
and carries grape juice to the
swine, the kind of dope they like;
he starts to work ere break of day, and
plugs along till dusk is gray, and hasn't
time to strike. He stands in need of
shorter hours, more time to sleep in cozy
bowers, more time to rest and read; but he
can hear the horses neigh for bundles of
refreshing hay, the mules for fodder plead.
The old gray mare is beastly sick, the colic
makes her roll and kick, and stand upon
her head; and so he nurses her all night,
until she's feeling well and right, instead
of being dead. He has to hunt a missing
sow, or saw the antler from a cow, so she
won't hook again; he has to crawl beneath
a crib and spoil his tucker and his bib, to
find a setting hen. The farmer has more
cause to strike than Jonathan and Pete and
Mike, who in the cities live; but he has
many chores in view, and walk-out stunts
would never do—no profit would they
give. But if the farmer struck, ah, me! Oh,
where in blitzen would we be, and where
would we get off? There'd be no bacon
and no beans, no flour or meal or helpful
greens, no skim milk in the trough. If
e'er the farmers organize, and strike as
strike the other guys, there'll be a frightful
dearth, and we'll fold up our weary limbs,
and heave a sigh and close our glims, and
just fall off the earth.—WALT MASON.

THE PURDUE AGRICULTURIST

VOLUME XIV

JANUARY, 1920

NUMBER 4

How Farmers Make Fall Pigs Profitable

By J. R. Wiley, Assistant in Animal Husbandry.

FARMERS who make good money on fall pigs are careful to provide the conditions which will enable their pigs to grow and thrive. They feed strong vigorous pigs that have made a good growth before cold weather sets in, give them proper feeds, provide dry warm living quarters that are well ventilated, keep the feeding quarters clean and sanitary, supply plenty of water that is not ice cold and keep their pigs free from lice and worms.

Strong vigorous sows that farrow their pigs during the early part of September are the source of thrifty, growthy fall pigs. Good hog men have learned that with good feed and proper care the early September pigs from such sows get enough size and flesh to withstand the cold weather drawbacks fairly well by the time it comes. The late September or October pigs, especially in the northern part of Indiana, are not usually large and growthy enough when cold weather comes. They have to use a greater proportion of their feed to keep their bodies warm and have a smaller proportion to grow and fatten on compared with the larger pigs.

Feeding the Fall Pigs.

Our best hog feeders are coming more and more to the self-feeder, especially for their fall pigs. They realize that the fall pigs need all the good feed their digestive systems can handle to nourish their bodies, keep warm and still have a profitable margin left to grow and fatten on. Did any farmer ever make any money by being stingy with the feed his fall pigs get? Indiana farmers could hardly adopt a more profitable hog feeding slogan than:

"Self-feed all fall pigs." The only exception to this might be gilts and boars being grown for breeding purposes.

Corn, barley, oats and rye, supplemented with good wheat middlings, skim milk, 60 per cent tankage or fish-meal, are generally the most economical feeds to use. Most of our good hog men grind barley and rye and as a rule they grind oats. Some who self-feed oats with corn and tankage prefer to feed the oats whole rather than to go to the expense of getting it ground. The Illinois Experiment Station has found this to be an economical method of feeding oats to growing and fattening hogs.

Practical rations commonly fed to fall pigs are: Corn 90 pounds, tankage 10 pounds; corn 45 pounds, barley 45 pounds, tankage 10 pounds; corn 70 pounds, oats 20 pounds, tankage 10 pounds; corn 70 pounds, wheat middlings 20 pounds, tankage 10 pounds. Any of these rations may be mixed and self-fed or self-fed free-choice. Fish-meal may be substituted pound for pound for tankage. If skim milk is available, feed about three pounds of it to each pound of grain eaten.

Keep Pigs Dry and Warm.

Good hog men are particularly careful to keep their fall pigs dry and warm. Experience has taught them that there's no profit in feeding a shiverer. Especially do they keep their pigs dry. They know that a dry pig can withstand considerable cold; that troubles comes when cold and dampness are combined. A damp pig is easily chilled. Rheumatism or pneumonia may follow.

Ventilation is a great help in keeping winter quarters dry. This does not mean cold drafts; they should be avoided as far as possible. The important thing is a frequent change of air to carry away the moisture. Plenty of dry bedding is another foe of dampness. Not a big lot once a month but smaller amounts at

least once each week. Use enough to keep the pigs' nest dry and comfortable at all times.

Lice and Worms.

Lice and worms are more troublesome in fall pigs than spring pigs. The former are almost sure to become badly infested with these parasites if no preventive measures are practiced. Frequent applications of crude oil will control the lice. Just confine the pigs to a pen bedded with fresh straw and apply the oil with a hand sprinkler or a spray pump. Crude oil has the double advantage of killing both lice and nits and not chilling the pigs like a water solution.

Clean, sanitary quarters help to prevent worms. So does a concrete feeding floor that is cleaned every week or two. A commonly used cure for worms is a teaspoonful of turpentine for each 80-pound pig or its equivalent, given in milk for three successive days after dieting the pigs 12 to 15 hours.

Purdue Extension Bulletin No. 40 recommends the following mixture self-fed as a general hog tonic and conditioner: Copperas three parts; sal soda three parts; Glauber's salts three parts; common salt three parts; charcoal five parts. Powder the copperas as fine as possible

or dissolve it in warm water and sprinkle the solution over the rest of the mixture. The other ingredients should also be broken up fairly fine.

An abundance of clean drinking water from which the ice chill has been removed is provided by many of Indiana's most successful hog raisers. They have learned that it is cheaper to warm up water with other materials than the heat from the feed which their hogs eat during the cold season. Some of these farmers are using commercial waterers equipped with an oil lamp heating device. Those who have used them recommend them highly.

There is considerable variation in the detailed methods by which Indiana farmers get strong growthy fall pigs; in the way in which they feed them; in their manner of keeping them dry and warm; in ventilating their quarters; in keeping the feeding quarters sanitary; in preventing lice and worms, and in supplying plenty of drinking water that is not ice cold. But all farmers who are making the most money out of their fall pigs provide these fundamentals. They know that profits start a-tottering when any of them are neglected.

Winter Management of the Brood Mare

By P. T. Brown, '21.

THE importance of proper feed and care for the brood mare during winter cannot be over-emphasized. A good horseman is invariably known by the way he winters his mares and by the thrift and vigor of the foals produced by them. It is estimated by reliable authorities that not over 60 per cent of the mares bred each year produce living foals. A large proportion of these failures are due to abortion which occurs most generally during winter. Because of inattention to the details of feeding and care many mares become badly constipated or develop some other condition detrimental to the safe delivery of a healthy foal. All the care and attention bestowed at this time will be amply repaid.

Proper management requires that the mare be so wintered as to insure in the

greatest degree possible the delivery of a fully developed lusty foal and at the least possible cost. Reproduction is a natural function of all species and requires only natural conditions for its successful accomplishment. These natural conditions are secured largely by maintaining a proper balance between feed and exercise. It is a matter of give and take between them. Feed furnishes energy and tissue forming materials while work requires energy and uses up tissue. Thus the balance between them is maintained. This proper balance is indicated by the condition as reflected by a bright eye, sleek coat, keen appetite and general tone of nerve and muscle.

This brings us to the question of how to provide exercise. An increasing number of farmers are coming to believe that

sane and economical exercise is best provided through moderate work. Most farm mares work during the summer but are allowed to remain idle through the winter season. Nothing is more natural and necessary for a vigorous mare than an abundance of exercise and when deprived of it she suffers in various ways. In the first place she soon acquires a fund of surplus energy which manifests itself in outbursts of play or other activities which may result in a slip, fall or a kick and consequent loss of the foal. Continued

right up to the time of foaling with excellent results.

Along with exercise comes the question of feeding. The ration must supply liberal amounts of protein, lime and phosphorus in order to furnish sufficient bone and muscle material for the growing foetus. A pregnant mare tends to fatten easily and the ration must therefore be low in fat content. Furthermore the ration should contain a laxative agent such as bran or some roots, preferably carrots. Oats are the standard grain feed and al-



Pure Bred Percheron Mares. With proper winter feeding and exercise the mare is in proper condition for spring work in addition to nursing her foal.

confinement leads to improper functioning of the digestive and the excretory organs. If the mare is allowed to exercise at will in a pasture she will do very well provided she is furnished shelter from inclement weather and carefully watched at all times. Working the mare has the advantage that she is constantly under the eye of the driver; the exercise is safer and more regular than the playful antics indulged in at pasture; and there is less danger of a kick or a slip on ice. But precautions must be observed. Avoid extremely heavy hauling, backing heavy loads, rapid work over rough ground, wading through deep mud or snow, or walking over slippery places when unshod. Many mares are worked regularly

falfa the standard hay. Corn alone makes a poor feed because of its fattening properties and also its low protein and ash content. Clover is an excellent hay but is often dusty or moldy. When free from dust it gives excellent results. It has a high protein and ash content and is therefore well adapted for feeding in connection with corn. The following are suggestions for making up a ration and should be modified and adapted to the local conditions:

- 1.—Oats, timothy hay.
- 2.—Oats, 4; corn, 6; bran, 3 parts by weight; timothy hay.
- 3.—Corn, alfalfa or clover $\frac{1}{2}$ and timothy hay $\frac{1}{2}$.

(Continued on Page 222)

Storage Diseases of Apples

IT is best, when considering the storage diseases of apples, to include in the discussion not only those diseases which attack the fruit while in storage, but also those which are introduced into the storage places with the fruit at harvesting time, and which continue to develop and cause greater losses while there. Nor are the pathogenic diseases the only ones worthy of notice, for there are certain physiological diseases of the apple which, in many cases, cause more severe losses than the common rots. The rotting of apples is due chiefly to the action of certain fungi, rather than to bacteria, for bacteria do not find the acid reaction of the apple pulp favorable to their development. It has been found that the fungi causing Black Rot, Bitter Rot and Soft Rot are responsible for most of the decay in apples.

Black Rot (*Sphaeropsis malorum*) causes to develop on the surface of the fruit one or more brown spots which gradually spread until the whole apple may become decayed, the pulp remaining tolerably firm. As the disease progresses, the surface of the decayed area becomes darker (or even quite black) in color, and is seen to be studded with tiny pimples or pustules. These are the fruiting bodies of the fungus which causes the rot and contains the spores by which it is propagated. A microscopic examination of the diseased pulp shows that it is permeated by the thread-like mycelium or vegetable part of the fungus.

Bitter Rot (*Gloeosporium fructigenum*) is a rot somewhat similar in appearance to the foregoing, when observed with the naked eye. The tissues of the fruit, however, become rather soft and slightly sunken as the disease progresses, though the fruit may eventually dry up and mummify. The pulp decayed by this disease has a very bitter flavor. In this disease the spore bearing organs are arranged in concentric rings on the decayed area.

Soft Rot (*Penicillium glaucum*) may cause the pulp of the fruit attacked by it to become very soft. The area will be somewhat lighter in color than in the case

of the other rots, usually being of a light or yellowish brown. The spore bearing bodies of the fungus are white, rounded tufts upon the surface. The tufts assume a bluish-green color as they increase in age, due to the maturity of the spores. The rot is very common on all kinds of decaying matter.

Apple Scab (*Venturia pomi*) is not uncommonly found developing in storage, both around the edges of the old spots and in newly infected areas. Sometimes scab spots develop in storage on apples which were perfect when stored.

The spores of the fungi causing all these diseases are produced in immense numbers, especially in case of Soft Rot, and, as they are easily floated by slight currents of air, they are widely distributed. In all ordinary forms of handling, apples are more or less exposed to infection by them, but certain precautions will tend to limit the danger. Apples barreled in the orchard are less likely to be infected than those which are previously stored, uncovered, in dusty barns or moldy cellars. The barrels themselves, especially flour barrels, are likely to be the source of infection unless they are thoroughly cleaned. The mold fungus producing Soft Rot develops abundantly on such barrels if they are exposed to moisture. Heat and moisture favor the development of the rot-producing fungi—hence the advisability of storing in cool, dry places. In general it may be said that cold storage is the most practical method which we at present have of controlling rots. But it is possible to assist cold storage in this function by adopting certain methods which have, as a result of long and careful experiment, been recommended.

Apples intended for cold storage should be well grown, sound and unblemished. This may be accomplished by thorough spraying to control attacks of insects and fungous diseases. The fruit should be carefully graded before it is packed for storage. It is important that the fruit be handled carefully in picking, packing and storing, for any place where the skin is broken affords an easy entrance for

fungi, and a good medium for their growth.

About the only physiological disease of apples is that known as apple "scald." It is a condition which may appear on some varieties of apples after the fruit reaches a certain degree of ripeness, but usually it does not develop until after the fruit is stored. It causes the surface of the apple to become dull brown in color and, though the flesh of the fruit is not affected by it, the commercial value of the fruit is lessened by the loss in attractiveness. The nature of "scald" is not yet well understood, in spite of extensive investigations and experiments relative to it. The theory now is that the disease is a mixing of the cell contents, or the premature death of the cells, and a subsequent browning by oxidation through the influence of the normal oxidizing ferments of the cell. Certain varieties, such as Grimes, Iowa Blush and Louise, are very susceptible to the disease, while Allen Choice, Jonathan and Northwestern Greening are among a group of varieties

which do not seem to be affected by it. Immature fruit scalds earlier and more than well colored, fully matured fruit, as does also overripe stock, or that in which there has been delay between the time when it was picked and stored, especially if the weather is warm. The least amount of "scald" is found in apples which are fully matured, well colored, and stored immediately after picking. Scalded fruit will "break down" in storage quicker than unaffected fruit, and a great decline in quality is consequent. Any delay in getting the fruit into cold storage after it is picked should be eliminated, because as soon as an apple is picked the growth stops, and the ripening process is greatly hastened. This ripening is considerably aided by a high temperature, and is retarded by a low one, so that the fruit must be stored at once to prevent its becoming overripe. It has been found that a uniform temperature of 35° F. is best for preventing apples from scalding in storage, and that wrapping the fruit will tend to control both scalding and rotting.

Wintering the Farm Work Horse

By H. R. Hofford, '21.

MANY farmers do not give enough attention to wintering the farm horses. The appearance and condition of the horse in the spring can usually be taken as an index of the amount of consideration he has received from his master and in many cases gives as a "line" on the man himself.

Conditions during the winter months are much different from the summer months for most work horses and the farmer must take such things into consideration in planning his rations, watering and exercising the animals. The work horse on the average farm does not have a great amount of work to do during the winter and in such cases he should be exercised by being turned into a lot or field when the weather is at all suitable. On the other hand, some farmers turn their horses out into the wood or pasture lot on the worst of winter days and even leave them over night if it is not convenient to get them up.

This practice is even worse than leaving them in the barn without exercise, but the successful farmer will not follow either extreme. Horses should not be overcrowded in lots, especially in winter, as they are liable to be injured while playing. The fences of the pasture and lots should be in good repair with no loose wire or projecting nails upon which the horses can be cut. In thawing weather the horses should not be allowed to run over soft pastures due to the damage caused to the pastures.

The feeding of work horses is more of a problem in the winter than at any other season due to the great variability of the horses' work. Logical feeding must be used if the horses are to have the proper amounts of the right kind of feed and yet be as economical as possible. Some farmers can feed horses through the winter in good shape at much less cost than others, because, they think before they pitch just anything into the

horses' mangers. Some horses are fed the same feed and the same amount all seasons of the year. This is very wasteful and in many cases harmful. When a horse is working hard he should have the best of feed and plenty of it but in the winter when practically idle, substitutes can be used in place of the higher priced feeds. Timothy hay with a mixture of oats and corn is a good standard feed for working horses, but when idle, the hay may be substituted with good clean straw or fodder in at least two of the daily feeds and sometimes the third. The farmer will do well to have some of these cheaper substitutes for hay available in the winter and it will help a great deal toward lowering the cost of wintering the horses.

Many feeders are of the opinion that oats is the only efficient grain for work horses. This is not the case as the Ohio Agricultural Experiment Station carried on a lengthy feeding experiment with several teams of work horses. To one horse of each team was fed corn for grain and oats to the other. Careful watch was kept on the teams and the result showed that those fed corn had just as much endurance, showed just as much spirit and were no lazier than those fed oats. With corn just as good as oats, it is often possible to save considerable money by watching the prices of the two grains and feeding the cheaper. It is not necessary to grind grain for horses with sound teeth as experiments show there is not enough more food digested to pay for the trouble and expense of grinding. Too much concentrated feed should not be fed as it is injurious to digestion. Enough feed of a laxative character should be fed to keep the digestion in good shape and also enough salt should be given to keep the animal satisfied.

Experience of feeders shows that there is a wide difference in the efficiency of horses in utilizing feed. Some horses will keep in excellent condition with almost half the feed that others require. By observing the individual horses we can detect such "easy keepers" and save much extra feed that would really be wasted if fed to them.

Another matter that many farmers neglect is watering the horses regularly.

Many a horse has stood in the stable all day suffering from lack of water. The horse should be offered water at least three times a day and never less than two. An experiment carried out by the Utah Experiment Station on the watering of horses showed that it was better to water before than after feeding grain. Watering before feeding gave the horse a little better appetite and he would eat more of his feed. It also proved that horses watered before feeding retained their weight better than those watered after feeding. A small drink of water before feeding, even when warm, will do no harm. However, the horse should never be allowed to drink all he wants as it would be too much and it is the over supply that gives trouble.

The horses' stable should be kept as clean as possible. If the stables get very filthy the horses become very dirty and are subject to scratches. The horse should be groomed every day, even if it is not worked. By so doing the skin and hair will be in better condition and the horse will look much more attractive. When the horse is being worked his shoulders and other parts coming in contact with the harness should receive extra attention as dirty shoulders, necks and backs cause harness sores which are very painful and often hard to cure. Care should be taken that lice do not get started on the horses during the winter months as they will take off many pounds of flesh besides causing the horse very much discomfort. If the horse is not shod his hoofs should be watched that they do not become long and crack. It is easy to cut off the excess hoof and often save a case of lameness.

If farmers would consider these points in wintering their work horses they would find that their horses would come through the winter in better shape and with less expense. How are your horses wintered?

Both men and women need to be good mixers—a man in his business, and a woman in her kitchen.

This is the month to butcher and cure meat. Get ready for the ice crop and the closing of farm accounts.

Indiana Animals Win Many Prizes

Capture Two of Biggest Prizes and Hoosier Girl's Calf Wins in Contest.

LIVESTOCK feeders and breeders from Indiana captured their usual number of prizes at the International Livestock Exposition at Chicago, November 29 to December 6, a resume of the winnings shows. Two of the six most coveted prizes of the show went to Hoosiers again this year. They were grand champion in the fat wether

showing and did as well or better than any other university in the country, especially in the steer classes.

In the senior yearling Shorthorn class, first and fourth went to Purdue; fifth in the junior yearling Shorthorn class and third on the Shorthorn herd of three. Second, third and sixth on the senior yearlings Angus steer went to Purdue as



First Prize Angus Herd at 1919 International, Shown by Purdue University.

classes and grand championship in the car load of fat hogs. Then Clara Ray, of Mellott, Ind., showed the grand champion steer in the baby beef contest. In addition to these awards, Purdue University took its usual number of prizes on fat steers, barrows and wethers, and breeders of the state made an excellent record despite the fact that they failed to land any grand championships in the respective breeds.

Purdue University's splendid record of the last two years, both of which the grand championships came to the Indiana institution, was not equaled this year but came very near it when the protege of Dean J. H. Skinner and Herdsman J. S. Douglas was barely nosed out of championship honors in the grade and cross-bred class by the steer that later won the coveted grand championship. However, the University made an excellent

did second in the junior yearling class and first on the Angus herd of three. Purdue's Ace, the university's best bet for the big prize was first in his class and also won the position of reserve champion in the college classes, being beaten by a spayed heifer shown by California University. Sixth place on senior yearling Hereford steer, fifth, sixth and seventh on junior yearlings all went to Purdue.

In fat barrow classes, especially on Berkshires, the University did well, capturing a total of eleven prizes on this breed alone. The list included three firsts. Nine prizes on Poland Chinas, including two firsts, were taken and three on Durocs.

For the fourth consecutive time J. C. Andrew, of West Point, showed the grand champion wether of the show, winning on a yearling.

Guy Myers, of Elwood, won the top prize offered for the best car load of hogs on a bunch of Hampshires. His father, who won the honor last year, showed the reserve champions this year, also champion of a bunch of Hampshire barrows.

In the breeding cattle classes, Warren T. McCray, of Kentland, who had the largest herd of Herefords at the show, won the most prizes, while J. W. VanNatta, of Lafayette, made an excellent record with eight Herefords he had there. W. W. Rose and Sons, of Ross-ville, with their Polled Shorthorns, won the most prizes in this breed, while J. H. Clamme, of Upland, made a good showing with only four animals, winning two firsts and a second prize. Angus breeders of the state also took several prizes, and George Ineichen, of Geneva, the only breeder of Red Polled Cattle from Indiana who showed took a goodly portion of the prize money.

McCray took five firsts, four seconds and eighteen lesser premiums. VanNatta got a first and senior championship in the Hereford cow classes, a second prize and four other times his cattle were in the money. J. Crouch and Son, Lafayette, had four head of Herefords in the money and Frank P. Fox, Indianapolis, had two bulls that drew prizes. C. J. Isley, of Lafayette, had one bull in the money and so did Smith Brothers, of Medaryville. The Renner Stock Farm, Hartford City, had several animals that took premiums, and Charles Hendry, of Kentland, who fed two Hereford steers in a baby beef calf club, took premiums in both calf club and open classes.

Rose and Sons took two firsts, three seconds and six other premiums. The other Hoosiers who drew prizes on their Shorthorns besides Mr. Clamme were O. C. Lower, of Atlanta; W. C. Wood, Pendleton; John Owen, Noblesville; John Grindle, Akron; Perry Hunt, of Danville; W. T. Morgan, of Bridgeport, and M. J. Ranck, of Roann. Ranck owned a junior bull calf, "Glenwood Stamp," who showed first in his class and later was made junior champion.

William Phares, Tipton; A. S. Cecil and Sons and Wilson Bros., of Muncie,

and E. M. Wilson, Anderson, had Angus cattle in the money several times, both breeding stock and fat steers.

Hoosier hog producers had their winnings, four standing out especially strong. They were Claire Rhode, of Pine Village, with Hampshires; J. K. Milner, Thorntown, with Chester Whites; Perry Barker, Thorntown, with Duroc-Jerseys, and John P. Stover, Crawfordsville, with Berkshires. Rhode had 15 premiums, including seven firsts and a junior championship on boar pig. Stover had two firsts, a second and championship on pen of barrows in his breed of hogs, and Barker seven premiums, including two firsts.

Harry Griffin, a pig club member at Lake Cicott, Cass County, showed a Poland China gilt, which was first in her class. Thomas Lonergan, of Rensselaer, and Alfred Goodrich, Rochester, won the prizes in the Chester White classes; Essig and Son, of Leesburg; Willie Essig, Tipton, and Michael Myer, of Elwood, in the Hampshire classes.

Jesse C. Andrew, West Point, and Keith B. Clark, of Clark's Hill, were the only Hoosier sheepmen with animals in the money besides Purdue University. Clark had the champion Cheviot wether and he won several prizes on breeding stock. Andrew scored high in the wether classes and took several prizes on breeding Shropshires.

Indiana horsemen got a fair share of the prizes in the classes they entered. W. Harvey Smith, Boswell showing the Junior champion Belgian mare Carval. He took two firsts in other classes and several lesser prizes. Harry Stamp, Roachdale; A. B. Carter, Carmel, and Henry Forbeck, Princetown, all had animals in the money in the Belgian show. Charles Cappel, a Shire breeder of Logansport, won seven premiums, including a first, and Otha Wyrick, of Kempton, placed horses in the money in the Clydesdale classes.

All in all, it was a big year for Indiana stockmen and the winnings that came to Indiana, despite the fact that there were more exhibitors from other states, bespeak much for the real worth of Hoosier animals.

Electric Lights in the Hen House

Within recent years some very interesting experiments have been worked out with regard to the effect of artificial light in the hen house upon egg production. Briefly, the results that have been obtained are as follows:

For the experiment two pens of pullets were used with thirty-five fowls in each pen. The fowls in each pen were as near alike as it was possible to obtain, and the fowls in one pen were used as a check upon those that were used in the experiment. The experiment was be-

birds a longer time for scratching, exercising, and eating. The object of the experiment was to simulate summer conditions as nearly as possible in order that the birds be induced to stay off the roost for a little longer time, and that they might devote more time to scratching and eating. It was noticed that there was a great decrease in the number of frozen combs in the test pen as compared to the number in the check pen.



Houses like these could be easily lighted by one electrical plant.

gun on October 1 when the pullets first began to lay. The lights were turned on at six o'clock in the morning and were allowed to burn until broad daylight. In the afternoon they were turned on just as the bright day light began to fade, which was generally about three o'clock in the afternoon, and were allowed to burn until eight o'clock in the evening. This gave the pullets a fourteen hour day of bright light, which in a general way corresponds to the length of day on June 21. At eight o'clock the bright light gradually became dimmer and in a period of twenty minutes was out entirely. The electrical part of the experiment was all regulated by an automatic clock.

Under natural conditions the greatest egg production comes at the time when the climatic conditions are right and when there is a long day. This gives the

The feeding of the check pen in the afternoon was done at 3:30, while the test pen was fed at six o'clock. By this arrangement it was possible that the feeding periods of the birds in the test pen be much more evenly distributed throughout the day than for the birds in the check pen. The results of the test pen showed that about 40 to 50 of the pullets were laying which was a very good yield for that period of the year, and which was a great deal higher than the egg production of the pullets in the check pen. It was noticed that many of the early molting hens were also laying that do not ordinarily lay at all at this time of the year. In the case of the test pens the hens responded to the treatment within two weeks of the time that it was started.

Home-forced Rhubarb

By V. V. Bowman, '20.

FARMERS are too often without fresh vegetables during the winter months. With a little care and at no great expense some vegetables can be forced, out of season, and thus provide for the table health-giving delicacies, once tried, always used.

Rhubarb is a vegetable well adapted to this use. Just a corner in the basement or cellar is all the space needed to grow all that a family can use. The space selected should be in total or partial darkness. If grown in total darkness the stalks are whitish and practically no leaf develops. If a little color is desired in the stalks, diffused light should be used. Diffused light will also facilitate care and harvesting of the crop. If brown paper is placed over the cellar windows, a desirable light is produced.

Rhubarb grown under these conditions is far superior in quality to that grown in the open field. The fibrous part of the stalk is not developed, and as a result the stalks are unusually crisp and tender.

The stalks are produced by planting the large fleshy roots dug from outside beds of rhubarb. Practically every farm garden has a small space in rhubarb plants, and this then will provide the roots for the forced crop. Since the stalks are produced by the stored-up food in the roots care should be used in selecting the roots to secure the largest and most vigorous ones available.

Two or three year-old roots are considered best. The roots should be dug in the fall before the ground freezes, and stored in a cool cellar or shed. Sufficient soil should be thrown over the roots to keep them moist.

It has been noticed that the stalks will grow more rapidly if the roots are subjected to a thorough freezing before they are planted. There is no danger of injuring them by freezing, and they should be frozen solid throughout. Two or three days of freezing is sufficient.

In planting the roots, place them close together on a bed of soil two or three inches deep, and cover them with two or three inches of soil. In adding this soil,

place a small amount on first and firm it well about the roots, then cover to the desired depths.

The bed should be thoroughly watered immediately after it is planted. Ordinarily it will not need to be watered oftener than twice a month thereafter, but this will depend on the location of the bed and other factors influencing the rapidity of evaporation. It should be kept moist, but overwatering is to be avoided, for it will cause decay.

The kind of soil used is of little importance, since no food is derived from it. In fact satisfactory yields have been secured from plants grown in coal ashes. The prime function of the soil or other substance used, is merely to hold moisture for the roots.

In order to provide for a succession of stalks, one should start new roots at intervals of about one month. Each planting should produce stalks for from four to six weeks after the first stalks are cut.

Rhubarb will grow at a fairly low temperature; a crop can be produced with the temperature at 45 degrees, but the best results are obtained at 55 to 60 degrees. At this temperature, stalks should be large enough to cut in one month after the roots are planted. If the temperature is higher than 60 degrees the stalk will grow more rapidly, but will be spindling and undesirable.

Under proper conditions three or four pounds of stalks per square foot should be produced.

The man who looks over his cattle every day to see how they're coming on, but doesn't go to the school once in a while to learn what his children are doing, has a wrong idea of values.

Corn and soybeans on the farm of Marshall Bowman in Jay county, brought a return of \$85.12 per acre when they were harvested by hogs. The corn was worth \$1.70 per bushel, final figures showed. Bowman co-operated with County Agent LeRoy Hoffman to show the value of this method in pork production.

The Story of Fyvvie Knight

It was just about one year ago that every one interested in Animal Husbandry and Pure Bred Live Stock was talking Fyvvie Knight. You will recall that Fyvvie Knight was the Grand Champion steer of the 1918 International Live Stock Exposition at Chicago. This steer was an Aberdeen-Angus bred, fed and shown by Purdue University. After the show the bullock was purchased by the Wilson Commission company, of Chicago, at the unprecedented figure of \$2.18 per

Before being cut up the carcass was displayed to the public on the "rue des Petits Champs." Explanatory cards told that Fyvvie Knight was the prize steer of America. According to a letter from the European representative for the Wilson Commission Co., to Dean J. H. Skinner, "The beef drew such a large crowd that policemen were detailed to keep the people moving." The following further quotation from the letter may be of interest to the readers of the Agriculturist:



Fyvvie in Paris (Courtesy Purdue Alumnus)

pound. This company dressed the beef and sent it to Paris to be the Prime Beef at the banquet of the International Peace Conference.

Upon arriving in Paris, Fyvvie Knight was received with an acclaim seldom awarded any American visitor. In another part of this issue there appears a picture of the dressed carcass of Fyvvie Knight being inspected by a group of distinguished Frenchmen in a refrigerator in the suburbs of Paris. The inspecting party is composed of the members of President Poincaré's household, the Minister of Food, the Minister of Commerce and the Minister of Agriculture.

"The maitre de hotel of the president's household was good enough to give us some interesting details of what took place at dinner. President Poincaré did something that he doubtless never did before—made remarks concerning what was about to be eaten. He explained before the invited diplomats that this was the first time that frozen beef had ever been served at a state dinner at the Elysee—that the beef had been given for the occasion by Wilson & Co., and that it was an exceptional prize animal.

"It is hard to say whether it was the effect of the speech or the quality of the

(Continued on Page 226)

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

THE NEW YEAR

And now it is a new year! Call it your year of opportunity and take a new grip on life. From this point of vantage one can look backward to 1919 and see forward to 1920. Were you satisfied with your work of the past year? How can you better it during the coming year? This is the time of the year when everyone should take an invoice of himself. Consider those undertakings in which you have done your best as assets; those which were done half heartedly as liabilities. If you have failed in something do not lost your courage; remember "a worm is the only thing that can't fall down." Start out the new year with a determination to make it a "bumper," and let your record be brighter and better than ever before.

PERSEVERANCE WINS

There is seldom a line written but a line of suffering runs parallel with it, and those that read the former and do not decipher the spotted and worn inscription hardly realize its real worth and significance. Fortune, success, fame, position are never gained, but tenaciously sticking and living to a thing until it is duly accomplished, no matter what the cost may be.

To accomplish this one must be awake and always put forth the best efforts.

Mother nature never intended that strong, independent beings should be reared by clinging to others, like the ivy to the oak for support. The difficulties, hardships and adversities of life are all positive blessings. They knit our muscles' more firmly and teach us self-reliance, just as by wrestling with a superior athlete we increase our strength and probably learn the secret of his skill.

The oak that stands alone to contend with the tempest's blasts only takes deeper root and stands the firmer for ensuing storms; while the forest tree, when the woodman's ax has spoiled its surroundings, sways and bends and trembles and perchance is uprooted. So it is with men. Those who are trained to self-reliance are ready to go out and contend in the sternest conflicts of life, while men who have always leaned for support on those around them are never prepared to face the adversities of life.

Purdue won several hundred dollars in prizes at the International and the show steers sold from 24.5 to 35 cents per pound.

Lest you forget, the eight weeks' winter course at Purdue will begin December 29 and continue for nine weeks, as it also includes the week course beginning January 12.

INDIANA AT THE INTERNATIONAL.

The 1919 International has once again clearly demonstrated that Indiana is one of the leading states in all lines of agriculture. As usual the Hoosier sons came in for their good share of the prizes.

An Indiana girl won the Grand Championship in the Junior Feeding Contest. The Grand Champion Wether of the show and the Grand Champion car load of hogs were Indiana products. The Indiana corn captured about three-fourths of all the prizes offered. Breeders of pure bred live stock of all breeds came in for scores of prizes.

These winnings are in themselves significant of the fact that Indiana is in a very decided way proving that she is one of the leaders in agriculture. They show that the campaigns for more and better live stock of all breeds, for bigger and better crops, and for the most improved methods in all branches of agricultural work are impressing themselves in a very decided manner.

PROGRESS.

We are living in an age of new records and rapid advancement in rural life. Social, political and economic changes keep the intelligent farmer ever on the alert. He is realizing as never before the importance of keeping abreast with the times. The modern farmer must not only understand and know the laws and principles underlying agriculture, but he must also become a farming engineer, a business man and a sociologist. All these he can do in his spare moments by devoting a little time each day to the reading of agricultural literature. Every farm home should have its agricultural library, consisting of works along the various lines to interest the family. The coming of the long winter day affords excellent opportunity for reading and study on the farm. Let the farmer get on the mailing list of the experiment station, study the market quotations of the daily papers, be a subscriber to some reliable farm journals and in this way link himself with the rest of the world.

Swapping dollars enriches nobody, but swapping ideas enriches both parties to the trade.

AN UNNECESSARY LOSS.

One of the principal reasons for the high price of leather and everything made from leather is the great loss from imperfect hides.

Branding and barbed wire fences are the cause of many imperfections, but probably the greatest source of loss are the injuries caused by grubs and ticks during the life of the animal. Ticky hides make leather of low grade, while grub holes limit the area of sound leather obtained and the used to which it can be put, yet it costs as much to tan and finish as leather from good hides.

When it is fully recognized by cattlemen that a creosote dip will eradicate these parasites at a cost of a few cents a head, there will be little excuse for adding this needless expense to leather manufacture.

CALENDAR FOR JANUARY—FARMERS' WEEK Jan. 12-16.

State Corn Growers' meeting, Jan. 14.

State Live Stock Breeders' association, Jan. 15.

Indiana Angus Breeders' association, Jan. 15.

Indiana Shorthorn Breeders' association, Jan. 15.

Indiana Home Economics association, Jan. 15.

Dairy Breeders' meeting, Jan. 15-16.

Indiana Breeders' association, Jan. 16.

Indiana Holstein Breeders' association, Jan. 16.

Indiana Jersey Cattle club, Jan. 16.

State Corn Show, Jan. 12-16.

Ham and Bacon Show, Jan. 12-16.

Purdue Apple Show, Jan. 12-16.

Indiana Sheep Breeders' and Feeders', Jan 16.

Six DeKalb county farmers, co-operating with County Agent A. Z. Arehart, have arranged to conduct cattle feeding demonstrations this winter. Each man is feeding a carload or more of steers and will keep exact figures on cost and rate of gain, etc. The men who have the demonstrations are George Harnes, Guy Orwig, Noah Lung, and Leray Likens, of Fairfield township; Burl Moughler, of Troy township, and H. M. Widney, of Concord township.

The Stock Judging Team

By M. L. Hall, '20.

THE Bronze Trophy was hotly contested for by the Student Judging Teams at the International Livestock Show this year. Keen interest was shown, for the team which wins the trophy three times is permitted to retain it. Purdue, along with several other teams has won it once. This year our team placed fifth with Texas capturing first honors among eighteen Univer-

Perhaps the best chance for the men to judge all classes of stock was at Illinois University. A fine opportunity was given to judge and learn the points of many classes and breeds, especially on sheep and horses. Another farm visited was McCray's Orchard Lake Farm at Kentland, the Home of the Fairfax's and the noted Hereford bull, Perfection Fairfax. An impression of Belgian type was



Fat Stock Judging Team.

sities. Sims, of Purdue, won fourth individual honors among all contestants and was high man of the team in the contest.

Prior to the contest at Chicago many trips were taken to large Stock farms and to the University of Illinois. Among the first places to be visited was the Jess Andrew farm, known as The Pines, south of Lafayette. Here the noted Minton flock of Shropshires, from England was seen, as well as several Avondale Shorthorns. Crouch's farm was visited twice, and many of his imported Percherons and pedigreed Herefords were judged. Poland China hogs were shown the men along with the Champion Boar Advertiser, at the Marshall farms at Monticello, Indiana.

gained from Stamps' Stock Farm at Roachdale, Indiana. Cecil's Angus herd, including the the International Champion cow and Clansman Poland Chinas were seen at Silverbrook farm near Muncie, Ind. Finally before going to the International a trip was made to Funkhouser's Poland China sale at Rockfield, and to Barker's Duroc and Berkshire herds and Milner's Chesterwhite herd at Thorntown, Ind. The owners and herdsmen of all farms visited were very considerate and gave the men some very valuable information from the breeders' standpoint.

The contest was held at the Stock Yards Amphitheater on Saturday, November 30. The eighteen different univer-

(Continued on Page 228)



"Happy as a Lark!"—*Pete Robinson*

"I am happy as a lark now, since I got my Perfection Milker," says Pete Robinson. "I have used two different kinds of milking machines but I find the Perfection superior to both. The construction of the teat cup, the manner in which it draws the milk, the small amount of vacuum required and the adjustment to suit different cows puts the Perfection in a class by itself. In my opinion there are only two classes of milking machines—The Perfection and all others."

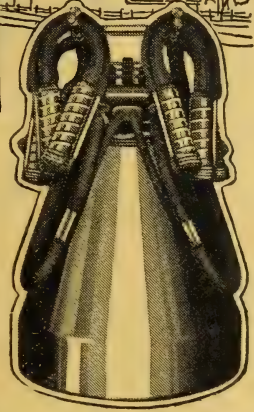
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PERFECTION MILKER

Hoosier Corn Growers Get Big Part of Prizes

INDIANA corn growers brought home from the 1919 International Hay and Grain Show held at Chicago November 29 to December 6, the premier honors of the corn world, Peter J. Lux, of Shelbyville, winning the highest honor. In addition to this grand prize, the corn men from this state got a lion's share of the other premiums, winning nearly three-fourths of the prizes in the corn classes which they competed.

Mr. Lux, the new corn kind of the world, won on a twenty ear sample of Johnson County white corn. Competition for this honor dwindled to four Indiana men, J. B. Hamilton, a fellow townsman of Mr. Lux, who won first on a twenty ear sample of yellow corn in the same region; C. E. Troyer, of Lafontaine, and W. J. Ulrey, of Attica, who won first on white and yellow corn respectively in region 3, which included the northern half of the state, Hoosiers took \$1,384 of the \$2,000 in corn prizes for which they competed.

W. R. Butler, of Kokomo, formerly agricultural agent in Madison County, showed the champion single ear of yellow corn in the show and was defeated on sweepstakes honors in the single ear class by only a narrow margin, an ear of white corn shown by John Roads, of Bainbridge, O., winning the highest honors in this class.

Twenty-nine states and six Canadian provinces were represented in the hay and grain show and it was with men from this wide territory that the Hoosier corn growers had to compete. There were no exhibits of hay from Indiana and the few displays of small grain got a small share of the prize money.

Shelby County led all others in the state in the number of exhibitors at the show and also in the number of prizes won. Fourteen corn or small grain growers from that county had exhibits at the show and all but four of these placed in the money.

The Hoosiers, besides these mentioned, who won prizes in the white corn classes were Frank and Edward Lux, Shelbyville; Charles Short, Greensburg; L. M.

Vogler, Hope; John Beyer, of Shelbyville; Roy Clore and Joseph Isley, Franklin; Oscar Bray, Monrovia; Ray Strouse, Huntington; Jacob Mundell, Frankfort, and David Conger, Anderson.

Besides the three top men in the yellow corn classes, Indianians who won prizes were Herman L. Miller, Bluffton; W. D. Littlejohn and James Corbin, Kentland; E. E. Byers, of Lafayette, R. R. 9; Joseph Crane and G. W. Lewis, Wingate; John H. Keener, Winchester; J. W. Kerlin, Rockfield; John Lux, Plainfield; Henry Mozingo, Shelbyville, and several other winners in the white corn classes.

Small grain growers in Indiana who placed in the money on wheat were Cliff Martin, Muncie; Jacob Mundell, Frankfort, and Sauerman Bros., Crown Point; on oats, Mr. Martin and Sauerman Bros., Joseph Isley, Franklin, and William Tritch, Corunna.

Purdue University played a big part in the hay and grain show, contributing one of the best educational exhibits of the entire show; the "International Livestock and Grain Farm," one of the most attractive features of the show and "the big ear of corn" which attracted thousands of persons not only from Chicago but from every state that attended the stock show.

The exhibit consisted of a display by the soils and crops department to show the value of limestone in increasing crop yields of corn, wheat and clover, and by the animal husbandry department which showed the value of silage in the ration for fattening of two year old steers.

The big ear of corn showed at several state fairs and corn shows, first made for the Indiana exhibit at the Panama-Pacific Exposition, attracted more than any other exhibit at the show. It was 37 inches long, had 82 rows, 225 grains to the row, was 30 inches in circumference and had a total of 18,450 grains.

The International farm which showed an excellent crop rotation for cornbelt farms, how much livestock could be prof-



Placing the reinforcing steel of the door opening.

A Natco Silo

Costs a Little More— Lasts a LOT Longer

IT does cost more to build with everlasting Natco Hollow Tile than with materials that soon decay, but it's far cheaper in the long run. A Natco Silo will not rot, burn, burst or blow down. It has no hoops to tighten, needs no painting and seldom any repairs. You can pass a Natco Silo to your children practically as good as new. Or the farm will bring more should you wish to sell.

What do you intend to build? One of our farm building plans may help you—FREE while they last.

Farmers who figure costs closely are using Natco Hollow Tile for silos, dairy barns, hog houses, dwellings, etc. Our book "Natco on the Farm" describes and pictures many such uses. Send for it today—no charge. Ask your building supply dealer to quote you on Natco Hollow Tile.

National Fire Proofing Company
1221 Fulton Building
Pittsburgh, Pa.

23 Factories assure a wide
and economical distribution



Foundation and bottom courses of a Natco Silo. Note the still air spaces and the steel reinforcing bands.

itably carried, arrangement of farm buildings and fields to save labor, was worked out by farm management men from Purdue after conferences with various agricultural departments of the University. It was similar to that made at the state fair in September.

Much credit for the success of the show was due Prof. G. I. Christie, superintendent of the agricultural extension department, who was superintendent of the show; to W. Q. Fitch, of the extension staff who superintended the placing of the educational exhibits, and Russell G. East, Shelby county agent, who superintended the placing of all grain and hay exhibits.

A CREED OF WORK FOR WOMEN

I BELIEVE that every woman needs a skilled occupation developed to the degree of possible self-support.

She needs it commercially, for an insurance against reverses.

She needs it socially, for a comprehending sympathy with the world's workers.

She needs it intellectually, for a construction habit of mind which makes knowledge usable.

She needs it ethically, for a courageous willingness to do her share of the world's work.

She needs it aesthetically, for an understanding of harmony relationships as determining factors in conduct and work.

I BELIEVE that every young woman should practice this skilled occupation, up to the time of her marriage, for gainful ends with deliberate intent to acquire therefrom the widest possible professional and financial experience.

I BELIEVE that every woman should expect marriage to interrupt for some years the pursuit of any regular gainful occupation; that she should pre-arrange with her husband some equitable division of the family income such as will insure a genuine partnership, rather than a position of dependence (on either side); and that she should focus her chief thought during the early youth of her children upon the science and care of wise family life.

I BELIEVE that every woman should

hope to return, in the second leisure of middle age, to some of her early skilled occupation—either as an unsalaried worker in some one of its social phases, or, if income be an object, as a salaried worker in a phase of it requiring maturity and social experience.

I BELIEVE that this general policy of economic service for American Women would yield generous by-products of intelligence, responsibility and contentment.

Laura Drake Gill,

Ex-President Barnard College.

HOUSE CLEANING HINTS.

Notwithstanding the aversion of *pater familias* to house cleaning, the lady of the house recognizes it as a periodical necessity.

However, the house cleaning is too frequently limited to scrubbing the wood work, beating the carpets and brushing the furniture. Need of renewals are generally overlooked—sometimes because of the expense involved, sometimes because the housewife does not realize how easily she could do the work herself and sometimes because she just doesn't think of it.

In every house, are to be found many things made of metal which become tarnished and shabby. Such things as andirons, water faucets, etc., can be gone over with a little metal lacquer and made to look like new.

Picture frames, chandeliers and other articles, which were originally gilded or gold enameled, can be easily and quickly renewed with a little gold enamel. It is better to get that sold in combination cans ready for mixing with a little brush with which to apply it. Gold enamel will also vastly improve the appearance of tarnished radiators.

Even the shabbiness of the leather chairs may be removed with leather renewer with which the worn spots may be touched up. Leather renewers made of pyroxyline are preferable as they do not crack or rub off.

All of these re-vampers and renewers may be found in drug, paint and general stores. They are obtainable in small packages, cost very little and are easily applied.



TOP DRESSING TALKS, No. 3

Fertility in Coal—

Do you realize the enormous amount of nitrogen that is taken annually from American coal mines?

An acre of coal four feet thick contains approximately 72 tons of nitrogen. Twelve tons of this are recoverable as 48 tons of **Sulphate of Ammonia**. This is sufficient to top dress one acre of land at the rate of 100 lbs. **Sulphate of Ammonia** annually for 960 years.

Although the production of **Sulphate of Ammonia** has doubled in the last five years, one-half of the possible production from the coke now made is wasted every year through lack of by-product ovens. The wasteful beehive ovens now used in coking coal will be replaced with by-product ovens when there is sufficient demand for the by-products. This will be when the American farmers and agricultural workers realize the importance of conserving America's resources.

ARCADIAN

Sulphate of Ammonia

There is no better carrier of nitrogen than **Arcadian Sulphate of Ammonia**. It is a low-priced ammoniate because it is a by-product of the American coke ovens.

Top dressings of **Arcadian** will double yields and aid in the conservation of our national resources. It is "The Great American Ammoniate."

Sulphate of Ammonia is the well-known standard article that has done you good service in your mixed fertilizers for years past.

Arcadian is the kiln-dried and screened grade, made fine and dry for top dressing purposes. Ammonia 25¼% guaranteed. Made in U. S. A.

If you would like to become better acquainted with **Arcadian Sulphate of Ammonia**, write for our booklets.

Baltimore, Md.
Atlanta, Ga.

The *Barrett* Company

Medina, Ohio.
Berkeley, Cal.

AGRICULTURAL DEPARTMENT, NEW YORK



Dear Boys and Girls:—

Say, but that was some trip. Chicago is sure a big town—and has more things to see in it than I ever imagined one town could have. The big bunch of club boys and girls reached Chicago Sunday evening and I was down to the train to meet them. I think that some of them were like me and had never been in a big city before for I saw them looking all around at the big buildings and I heard a little city boy say "It sure is a good ting dat the sun ain't shinin' or dem country kids wud sunburn de roofs of dere mouves." I don't know exactly what he meant for I didn't understand the language he used as none of the club boys talk that way. The boys and I stayed at the Y. M. C. A. hotel and had a fine time riding up and down the elevators.

We jumped up early Monday morning and rode a car that ran away up in the air out to the International. I thought at first that the car might fly away with us and get lost but the man that was running it seemed to know right where to go and guided the car right out to the Big Show. There were so many animals to look at that the first day we just walked around trying to see everything all at once.

On Tuesday we went out to the Armour Packing plant and saw a lot of new things. It seemed to me that they must make everything there. They even had a soap kettle that was as high as a five story building. I thought that it would hold enough soap to last me for all the rest of my life. The people in that plant gave us all kinds of things to eat and they called it a curtain raising lunch, but very many curtain raisers like that would sure fill me up. Next we went down to the Armour Cafeteria where we had what was called the real lunch and it was so real that I had to quit before it was over. I'll never forget the piece of steak that I had and I expect to dream of it years

from now. After the lunch Mr. Armour and a lot of other gentlemen talked to us but I was so full that I couldn't listen. That evening we went to the gymnasium in the Armour building and we sure saw a fine entertainment.

Wednesday found us down in Chicago seeing all sorts of new and wonderful things. We went to the Art Institute and saw the finest pictures and all sorts of things to fight with and a lot of things that I didn't even know how to use and then we went to a place that I'll never forget. The men had been talking about a place that they called Marshall Field's and I wondered what kind of a field a Marshall Field was. I know what a cornfield, a clover field and a lot of other kinds of fields were but I never had heard of a Marshall Field. It sure was a surprise to find out that it was a man's name and that his place was a great big store. And of all the stores I ever dreamed of it sure was the biggest. Why it seemed almost a mile across to me. There was everything in that store too and I wanted to buy some Christmas presents but a man had charged me so much for a ride in a taxi that I was about broke. Wednesday night we went out to the International and that man that was guiding the car found his way alright in the dark without any light. He sure must know a lot about that city. We saw all kinds of horses, hogs, cattle and sheep at the show and learned a lot of things about all of them.

Thursday we went out for lunch with a man named Mr. Wilson who had another one of those packing plants. There we had a lot more fine things to eat and some more speeches and then one of the men said "You will now be entertained by Frederick the Great." Now I knew very well from my history that Frederick the Great was dead and thought the man was fooling us when all of a sudden out

(Continued on Page 230)



Write Home, "Sell the Horses"

Tell the folks at home to sell the extra horses *now* and save the feed—that when Spring comes a Cletrac will work faster, longer, and at less cost—that the Cletrac *really* takes the place of horses.

It isn't a tractor that shirks the unhandy jobs in tight corners and sticky places. It goes anywhere a team can work—turns short—has plenty of power left to pull a profitable load besides "making the grade" or crossing

soft ground. Burns kerosene, too.

You know that any tractor runs better after it's worked in—after the operator gets used to it—and light work the next few months will fit both man and machine for fast, hard work when the rush comes.

Give the folks the benefit of your foresight. Write us for our booklet, "Selecting Your Tractor," or write them at home to ask a Cletrac dealer for it.

The Cleveland Tractor Co.

19123 Euclid Avenue, CLEVELAND, OHIO

Largest Producers of Tank-Type Tractors in the World

Home Economics Classes in Indiana

By Lella R. Gaddis, Indiana State Leader
of Home Demonstration Work.

"**B**ETTER homes for Indiana," is the slogan of the Home Economics classes, which comprise one of the strongest women's organizations in the state.

In 1910, through the efforts of Miss Gertrude McCheyne, the first Home Economics Extension worker, and the Farmers' Institute workers, twelve Home Economics classes were organized in In-

6. That the study of home problems be made of no less cultural value than the study of art or literature and of much more immediate value.

7. That the most profitable, the most interesting study for women is the home, for in it center all the issues of life.

Women of all ages and with varied interests are members of these classes. Community interest is developed and



A consolidated school in which meetings are held and for which the piano was purchased.

diana, representing organizations in ten counties. At the present time we have 247 classes in 58 counties.

A constitution, by-laws and study outline are sent out from the Home Economics Division of Extension Department of Purdue University. Each outline has the following creed which states the purpose of the class: We believe—

1. That right living should be the fourth "R" in education.

2. That home making be regarded as a profession.

3. That on the foundation is built all that is good in state or individual.

4. That the spending of money is as important as the earning.

5. That the home maker should be as alert to make progress in her life work as the business or professional man.

many community projects are promoted by these classes.

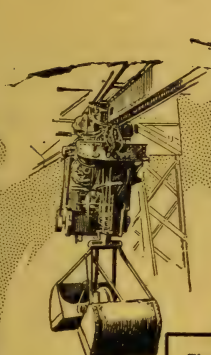
Montgomery, Hendricks and Clark counties have county federations which have sponsored the home demonstration agent movement along with many other community activities.

The following is quoted from the annual report of the Home Economics classes in Clark county:

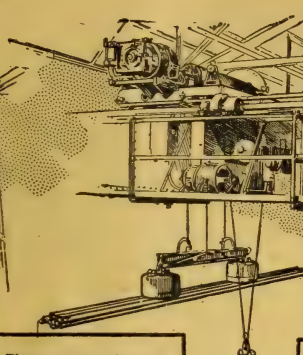
"The Bethlehem Township Club has been organized four years and has a record of never having missed a regular monthly meeting. This record is remarkable when one realizes the kind of roads and hills the women must travel in attending meetings. This club this year has bought a \$100 Liberty Bond, contributed to the Red Cross, helped establish a Girls' Canning Club, and have



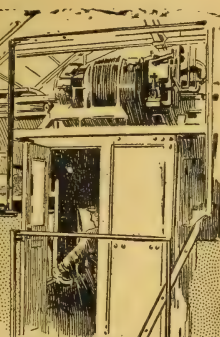
Tower clock wound automatically by one-half horse power motor.



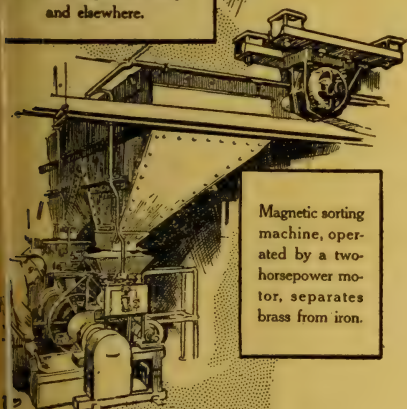
Electric monorail crane for hoisting coal.



Motor-generator set mounted on crane supplying power for lifting magnet.



Electrically-heated glue-pots are used in pattern shops and elsewhere.



Magnetic sorting machine, operated by a two-horsepower motor, separates brass from iron.



Machine operated by motor attached to lamp socket scrubs floors.

Electricity— the Master Force in Manufacturing

THE marvels of electricity have revolutionized our manufacturing industries. With belts and pulleys replaced by electric motors operating automatic—almost human—machines, many a slow and tedious process has been eliminated. The factory worker's task of yesterday is made pleasant by his command of this magic power.

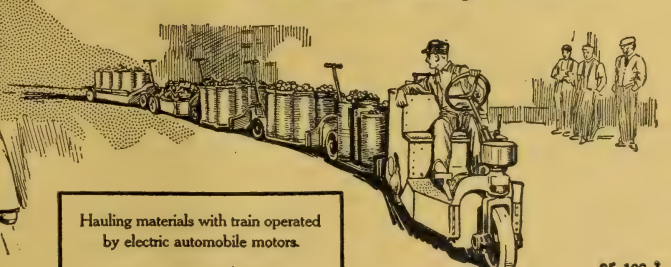
The Crane Company's plant at Chicago—electrical throughout—is a model of industrial efficiency. Its 10,000 horsepower of driving energy is brought by three small wires from a distant power plant. Then electricity drives the machinery which handles the coal for heating, cuts the steel, sifts the sand and sorts the material—in fact does everything from scrubbing the floor to winding the clock.

Such an institution is marvelous—superhuman—made thus by the man-multiplying force of electricity. The General Electric Company has been instrumental in effecting this evolution. First, by developing successful electric generating and transmission apparatus to furnish economically this modern form of power. Secondly, through many years of active co-operation with hundreds of manufacturers, it has mastered the art of applying the use of electrical energy to a multitude of needs. And finally, through branch offices and other distributing channels, its products are made accessible to all.

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in
all large cities.



Hauling materials with train operated by electric automobile motors.

contributed to a barrel sent to the West Baden Military Hospital for Christmas. This club has a custom of remembering members who move away or leave the community with a silver spoon engraved with the club's initials."

"The Jeffersonville Township Club has been organized only a little over a year and has more than doubled its membership. Last spring this club gave a play-ette and after repeating it three times, realized \$150. They bought a piano for the consolidated school in the neighborhood where their regular monthly meet-

as well as other projects carried on in that community. They were instrumental in having some of their roads piked and are now working toward consolidated school for their township."

"Three years ago the Home Economics classes of Montgomery and Allen counties planned home tours. These were for the purpose of studying various homes from different standpoints, namely, built in labor saving devices, heating, lighting and water systems, and planting. Of such great benefit were these meetings to the women that one town-



The way Home Economics class members attend Guest Day meetings when the thermometer stands 95 in the shade.

ings are held. A French war baby has been adopted, they have contributed to the Red Cross, financially backed the Girls' Canning Club in the neighborhood, contributed to the Christmas box for the Clark County Orphans' Home located in Jeffersonville. During the entire year they have earned \$200.18, for which the above has been used. The following pictures show a Guest Day meeting of the club, also the consolidated school of that community. This club has in many ways proved itself a true community worker and leader."

"The Owen Township Club has a small membership, but has been a wonderful help to the community. They established a town pump, bought a piano for the church in the village to be used by all children in the community for music lessons, and have co-operated to a great extent with the hot school lunch project,

ship in Allen county put on home tours in June of this year.

"Seventeen machines started from the court house. Five stops were made, the first one being at the home of Mrs. John Spindler, whose home had been remodeled, bath room installed, kitchen remodeled, new interior decorations and furnishings. Yard planting had been started. Mr. Burkholder, of the Horticultural Department, staked off and demonstrated the effect of additional planting.

"The second home visited had installed a lighting plant and had a power washing machine.

"Lunch, which had been prepared by the members of the Home Economics class, was served at the third home. The kitchen had been remodeled and had an acetylene hot plate installed which were of interest. The next home was selected

(Continued on Page 232)



Illustration shows Case 10-18 Kerosene Tractor pulling 2-bottom Grand Detour Plow.



Look for the EAGLE
Our Trade Mark

Below: Showing the Main Frame of the CASE 10-18 Tractor, cast in a single piece. Holes for bearings on each side of frame are bored in one operation by a special machine of remarkable accuracy.



CASE—The Tractor with Strength that Backs its Power

One of the outstanding features of superiority of the Case 10-18 Tractor is the rugged strength of its construction.

Now, bear in mind the difference between Strength and Power.

When you think of the Tractor you have, or the Tractor you ought to have, you probably consider it in terms of power.

Right!—as far as it goes. The proper proportion of power to work is an absolute essential to

economy and efficiency of Tractor operation. But tractor Strength, as embodied in the Case is the factor that stands between you and repair bills and the more serious losses due to breakage or delays. For instance, the frame of the Case 10-18 Tractor is cast in a single piece. In this one casting are fitted the bearings for transmission, rear axle and motor. Obviously, bearings, shafting and gears cannot get out of line. Once in place, they are in correct alignment throughout the life of the tractor.

Other Features of the CASE 10-18 Kerosene Tractor

- Four cylinder motor, mounted crosswise. Eliminates bevel gears, chain or worm drive.
- Simple and accessible clutch, pulley mounted on crank shaft,—where it belongs. It is on the same side with the steering gears making it easy to line up with belt driven machinery.
- Automatic control of motor temperature assures fuel economy.
- Cut steel gears running in oil and dust-proof throughout.
- Hyatt Roller Bearings.
- Worm-driven fan with friction safety clutch.
- Two speeds: $2\frac{1}{4}$ and $3\frac{1}{2}$ miles per hour.

The Case 10-18 Tractor will most economically handle such work as operating a 2-bottom plow (as illustrated); 22 shoe grain drill; two 6 ft. binders; 8 ft. double-action disc harrow; the largest manure spreader; Case 20x28 thresher with feeder and wind stacker; feed mill, or any other

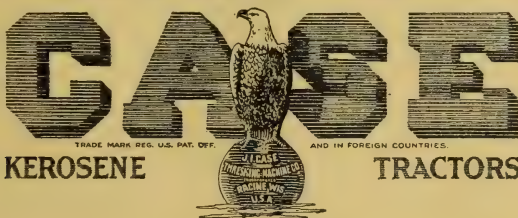
machinery of similar power requirement. Write for booklet illustrating complete details of Case 10-18 construction. It will acquaint you with the special advantages of the Case 10-18 and enable you to judge all tractors with a new understanding. Free, on request,—a post card will bring it.

To avoid confusion, the J. I. CASE THRESHING MACHINE COMPANY desires to have it known that it is not now and never has been interested in, or in any way connected or affiliated with, the J. I. Case Plow Works, or the Wallis Tractor Company, or the J. I. Case Plow Works Co.

J. I. CASE THRESHING MACHINE COMPANY, Inc., Dept. CB-1, Racine, Wis.

Making Superior Farm Machinery since 1842

NOTE: We want the public to understand that our plows are NOT the Case plows made by the J. I. Case Plow Works Co.



Rural Conditions in Western Europe

By J. J. Reid, '23.

AMONG the many and far reaching effects of the great war, perhaps none will be of greater importance to America than that resulting from the knowledge gained by some two million Americans of industrial and agricultural conditions in Western Europe. Much can be learned by the student of agriculture from Europe and European methods; likewise the European will profit greatly from a study of American industry and agriculture.

Farming in western Europe is never conducted on an extensive scale and many of the problems of the Yankee farmer are thus peculiar to America. The farm house, semi-isolated, not infrequently miles from the nearest town, is an American institution. The European does not live on the soil which he tills but lives in a village perhaps a mile or more from his holding. The problems of education in rural Europe do not include school hacks, for in the typical country village, all the children of the district live under one roof, the dwelling of many families consisting of one long building extending for several hundred yards along the street. A single roof, which is usually of thatch, serves to cover the household possessions, farming implements, feed, hay and livestock of more than a dozen families. And in this fact Americans found one of the few examples of far famed German efficiency, it being unnecessary for the European farmer to expose himself to the inclement weather prevalent there while feeding his hogs, chickens, cattle and other livestock, all being kept in rooms adjacent to those occupied by the family.

Conclusions as to the sanitary conditions prevailing in Western Europe can easily be drawn from the foregoing. Water for the use of the entire village is obtained from a centrally located well. With few exceptions these wells are polluted. However deadly to Americans this water may be it does not affect the Europeans. He does not drink it. Wines and beers only, serve as quenchers of thirst, and water is used in cooking, diluting the wine and watering the live stock.

All waste matter, manure and offal of every description is piled between the dwelling and the street. Such a location is very handy for the farmer as he can easily load it upon his two-wheeled cart and haul it to his land. This pile is seldom touched more than once during the year and sometimes almost hides the windows of the house from those passing upon the road before it is removed. None of this matter goes to waste however, for it is carefully guarded by the zealous husbandman.

Fences as we know them are not often seen in Europe. Perhaps the wire fence will come into its own now that the war is over and enormous stacks of barb wire remain to be salvaged. As a rule a sod wall separates adjoining land. This is very wasteful and contrary to the impression of most Americans that every inch of soil is under cultivation.

Woods are common, forests they might be termed for many are of considerable size and in comparison with France, Indiana is almost treeless. And this is a point which Americans will do well to note. Although France is a country which has been under cultivation for many centuries and is densely populated, the forested land is of far greater extent than in Indiana, lately a virgin forest. The forests are well cared for, not a branch or twig is to be seen upon the ground, all being gathered by the nearby villagers and used as fuel.

Farming implements of Europe are primitive. In northern France the implements imported from America before the war have been stolen or destroyed by the Germans and the wheat is now harvested entirely by hand. Crude wooden plows and implements of strange and unknown uses are to be found within the dwellings at such times as the men are not in the fields.

Oxen, milch cows, steers and horses are the beasts of burden and two of a kind are seldom seen working in the harness together, the milch cow-horse combination being a favorite in most districts.

(Continued on Page 234)



Exclusive Features in the **MOLINE** UNIVERSAL TRACTOR

Exclusive Features:

1. Does all field work including cultivating and harvesting.
2. Both tractor and implement operated by **one man**.
3. Tractor and implement form **one unit**.
4. Operator sits on implement at center of all controls of tractor and implement.
5. Operator sees his work. "Foresight is better than hindsight."
6. Tractive power in front of work, operator behind it.

Exclusive Results:

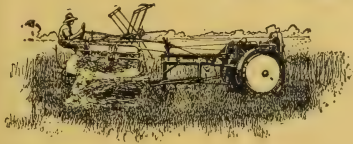
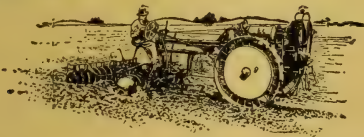
1. No duplication of any work by horses.
2. A saving in labor.
3. Entire outfit turns short, backs and makes fence corners produce.
4. Ease of operation.
5. Better work.
6. Power used as horses are used.

The Power of a Correct Principle

The principle of doing all field operations with one man sitting where he can watch his work is correct, or farming has always been done backward, and the operator would always have ridden or led his horses instead of driving them.

The Moline Universal Tractor places the power of nine big horses where the horses stood—is driven just like horses are driven, from the seat of the implement, and hitched up to the implement just like horses are hitched.

Note—If desired you can use the "drag behind" or horse-drawn implements you now have the same as with other types of tractors.



See your Moline Dealer or write our nearest branch for full information.

Moline Plow Company, Moline, Ill.

BRANCHES AT:

Atlanta
New Orleans
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Sioux Falls, S. D.
Des Moines
Bloomington, Ill.

Indianapolis
Columbus, Ohio
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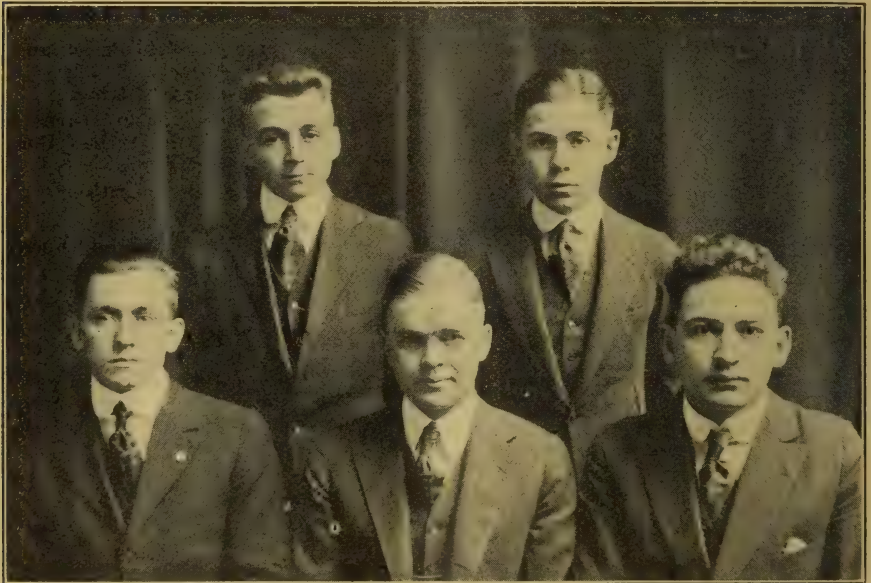
Horticulture Judging Team

By Prof. O. G. Anderson.

In an apple judging contest held at Des Moines, Iowa, on November 13, the Iowa Agricultural College won first place from Purdue by a margin of 1.41 points in team score. The total team scores were as follows: Iowa, 223.83; Purdue, 222.42. According to Prof. F. M. Harrington, the Ames coach, it was the closest contest ever held in the Missouri Valley.

forded ample space for one of the largest exhibits of fruits, vegetables and flowers ever staged by any horticultural organization.

Some of the Indiana growers who had exhibited fruit at the Indianapolis Apple Show loaded up an express car with fruit and made the long journey to Des Moines to compete in the state exhibit. Their winnings amounted to thirty-three prizes,



Apple Judging Team.

Although Iowa won the contest, the individual honors in judging belong to C. G. Randall, of the Purdue team. The contestants were graded on three distinct phases of the judging work, known as identification, judging or placing, and reasons. Mr. Randall obtained the highest grade in judging and in giving reasons, and a perfect score in identification. The other members of the Purdue team were I. C. Mead and W. S. Oberlin, with E. L. Joslin as alternate. This is the first year that Purdue has been represented by an apple judging team.

The contest was held in connection with the Mid-West Horticultural Exposition in the Coliseum. This building af-

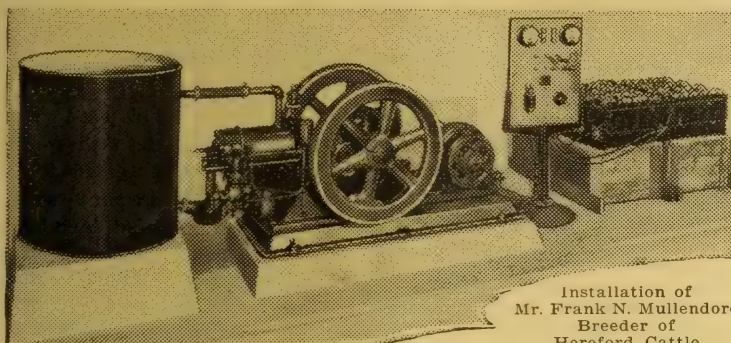
totalling \$400. Three of these were sweepstakes and were awarded as follows:

- 1—Best five boxes of apples.
- 2—Best five bushel baskets of apples.
- 3—Best single box of apples.

The other thirty prizes do not include the awards in the plate classes, which have not been announced.

Directors of the Huntington County Dairy association have voted to support a dairy calf club.

It often costs more to do without an implement that is really needed on the farm than the implement itself would cost.



Installation of
Mr. Frank N. Mullendore
Breeder of
Hereford Cattle
Franklin, Indiana

Investigate the Service that a **SWARTZ LIGHT PLANT** will give you

And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

A Word as to the Swartz Policy

From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

Send for Complete Information

There is a Swartz Electric Power and Light System of proper size and voltage to meet your individual requirements at minimum cost. Ask for your copy of the Swartz Catalogue.

Swartz Electric Company

Oldest Exclusive Makers.

General Offices and Works,
Speedway, Indianapolis

Indianapolis Branch,
5 N. Meridian St.

The Breeding Flock in Winter

By G. L. Fisher, '21.

In order that ewes be regular breeders, produce more and better lambs, they must be in a gaining condition at the breeding season. Feeding to produce this condition is called "flushing," and in order to accomplish this, the ewes should be changed from short pastures to some abundant pastures of timothy, blue grass or rape. If a good pasture is not to be had at this time some grain should be added to supplement the pasture. Oats is one of the best feeds, which can be secured for this purpose. If pumpkins are plentiful they may be scattered over the field instead of using grains.

After the ewes are bred they should be well cared for. If good pasture is available they can be turned on this until cold weather. Then they should be taken to a good barn or shed. The ideal winter shelter for ewes is one that has plenty of light and ventilation, but must be free from draughts. The quarters need not be so warm at this time of the year as the ewes will have a heavy coat of wool. Excellent results have been secured in open sheds, facing the south. Here plenty of ventilation can be secured, along with plenty of light. Winter quarters must be dry. If possible a spot should be selected which is slightly higher than that surrounding, so as to prevent water from running into the shed after a heavy rain or the melting of snows.

The sheep must also have plenty of room. Some authorities say from ten to sixteen square feet floor space per ewe, is not too much, especially after they are well along in the gestation period. The barn or shed must also have wide doorways, to prevent the ewes from being injured by pushing and jamming. Narrow doorways may result in the abortion of ewes heavy with lamb.

The ewes must receive plenty of feed during the winter. The feeding must be such as to produce the most vigorous and healthy lambs and at the same time keep the wool in the best condition. Sheep like variety in their feed, probably more than any of our other livestock, so the sheep-

herd should see that they receive several different kinds of feeds. Alfalfa, red clover and the other legumes are their favorites. Oats and peas sown together and harvested before they are too ripe make excellent winter feed. Blue grass hay, oat hay, bright corn fodder, corn silage, free from mold, and bright clean oat straw are also good to add variety. At no time should timothy or marsh hay be offered sheep, for the coarseness and woodiness of these feeds have caused the loss of many sheep from constipation. Besides this the heads of timothy and the seeds force their way into the wool and may cause much irritation of the skin, also many wool buyers object to buying wool which contain straw, hay and dirt.

It may also be desirable to add some grain to the ration, especially toward the latter part of the gestation period. A mixture consisting of one and one-half parts oats and one part bran has given very good results. The oats strengthens the ewe and the bran is a laxative, which helps to keep the digestive organs in good working order. Fat producing feeds such as corn, or barley, are not highly recommended for pregnant ewes unless fed plenty of leguminous hay. The amount of grain to feed will largely depend on conditions, but one-half pound per ewe per day is usually considered sufficient for a ewe weighing from 150 to 175 pounds.

Succulent feeds are also good for the ewes, since they add variety and serve as a laxative. Chopped roots are good and can be recommended, rutabagas having proven about as successful as any root crop. Silage has also been found to be a very good succulent feed, but silage for sheep must be of the very best quality. Frozen or soured silage may cause colic and scours. As to the amount of succulence to feed, two pounds can be fed daily with good results. This amount may be increased after lambing to four or five pounds per ewe per day. They also need plenty of good clean water and salt.

Another very important point to be considered in the management of preg-

Oliver

Always Ready

Sometimes unexpected work interferes with plowing when it should be done. The use of Oliver tractor plows keeps you always ready to overcome such a difficulty. Their good work, ease of operation and durability increases the profit to its maximum proportions.

OLIVER CHILLED PLOW WORKS,

Plowmakers for the World

Indianapolis, Ind.

South Bend, Ind.



nant ewes is exercise. This cannot be over-emphasized. The more the ewes walk and move about the stronger and healthier the lambs will be. One of the best ways to give the ewes plenty of exercise is to scatter the roughage around in small bunches. The ewes walking from bunch to bunch will in this way take plenty of exercise. Notwithstanding that exercise is needed for ewes, they should not be driven out in rainy weather or damp snows. This will wet the wool and cause the sheep to be uncomfortable, in many cases resulting in losses from colds and lung diseases.

The most important things to keep in mind are, dry, comfortable quarters, plenty of good feed, exercise and sufficient clean water.

PURDUE APPLE SHOW

The Purdue Apple Show which will be held the week beginning January 12 promises to be a great success. Different classes are provided in order that the general agriculturist will not have to com-

pete against the specialist. A thirty-two page premium list is being published which will cost in the neighborhood of \$120. This is made possible by the generosity of various concerns dealing in horticultural supplies and advertising in the premium list. The same and similar concerns are offering premiums to the extent of \$200. Among those offering premiums are the Elks' society, Horticultural club, Station Horticultural society, Prof. Lommel, and Prof. Anderson.

The Apple Show will be made up of not only plate exhibits, but will be featured by exhibits of pies baked by the Purdue girls. The various merchants are exhibiting many other fruits and their by-products. A judging contest will also be conducted which will be open to all Purdue Agricultural students, and C. L. Berkholder is offering a silver loving cup for the participant making the highest score. The show will be held at the Horticultural Green House on Marsteller street and will end with an auction of the fruit exhibited.

Order for Destruction of the Common Barberry

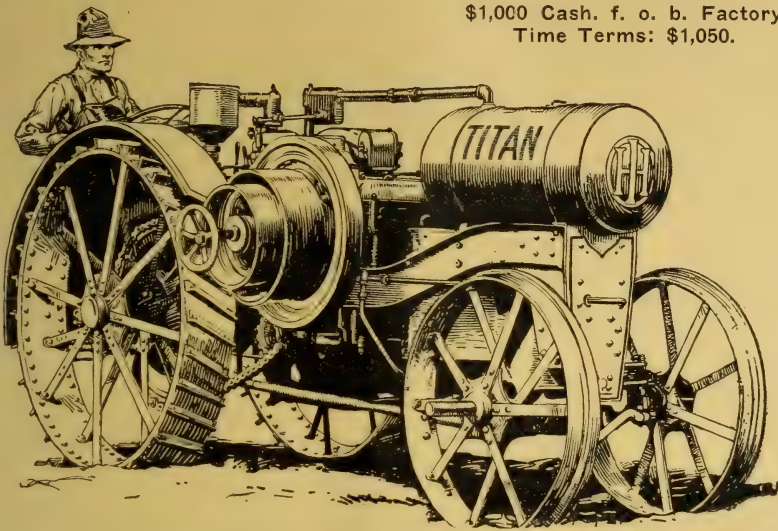
By W. E. Leer, '19.

DURING the past 200 years there have been numerous attempts to eradicate the common barberry and its horticultural varieties. The first barberry eradication law was passed in Rouen, France, as early as 1660. Connecticut, Rhode Island and Massachusetts all enacted laws against the barberry between 1726 and 1766. Several European countries, including part of England, France, Germany and Denmark, have passed laws requiring the eradication of the common barberry.

The most striking example of a barberry law which has been effective is the one enacted by Denmark in 1903. According to the Dannish authorities practically all, if not all, the barberberries have been removed from the lands of Denmark. Since their removal there has been no serious attacks of black stem rust in Denmark. A few minor attacks have been reported, but in every single instance the cause was directly traced to a common barberry bush which had escaped destruction.

Dannish agriculturists visited the United States during the past few years were amazingly surprised at the large number of common barberry bushes, which were found growing in the grain producing sections of this country. They were entirely unable to understand why these dangerous barberberries were allowed to grow when each year the black stem rust caused such enormous losses in our grain crops. Indeed it is hard to understand. The only reason which can be given is that our legislative bodies, made up largely of well meaning lawyers from our cities, have not been able to see the necessity of passing laws to eradicate this great menace to the grain growing industry.

The severe epidemics of the black stem rust in 1904 and 1916 caused losses amounting to many millions of dollars. In 1916 alone the losses in the United States and Canada amounted to over 180,000,000 bushels of wheat besides the great losses to the other grain crops.



\$1,000 Cash. f. o. b. Factory
Time Terms: \$1,050.

The Successful Tractor

must have provision to handle with equal advantage every drawbar and belt-power task on the farm.

The Titan 10-20 Kerosene Tractor has:

A drawbar with a wide range of adjustment both up and down and sidewise so that it will pull a plow, harrow, binder, wagon or any other machine or implement with equal advantage;

A friction-clutch pulley, so placed that the tractor can be backed in to the belt quickly; so placed, too, that the belt does not drag on the ground nor rub against any part of the tractor. Pulley has a wide face and broad diameter to insure against belt slippage;

A throttle governor that regulates the fuel to the load variations—no one required to adjust fuel when engaged in belt work.

If you are interested in advanced agricultural engineering practice let us tell you more about the **Titan 10-20** which is the final expression of fourteen years of continuous tractor manufacturing experience and a thorough knowledge of all farm requirements gained through almost 90 years of general farm-machine building experience.

INTERNATIONAL HARVESTER COMPANY

CHICAGO

OF AMERICA INC.

U S A

In 1904 Minnesota and the two Dakotas suffered losses amounting to over \$20,000,000, due to the black stem rust.

Almost immediately following the epidemic of 1916, which was largely responsible for the recent wheat shortage, the United States Department of Agriculture, in co-operation with state authorities began a vigorous campaign against the common barberry and its horticultural varieties. As a result of this campaign North Dakota, South Dakota, Minnesota, Iowa, Michigan and other states passed laws which have been very successful in eradicating the barberries from their states. Many provinces of Canada have followed the example set by these states and have outlawed the common barberry.

Indiana now has a barberry law. The conservation commission of Indiana, under the authority vested in it under the acts of 1919, has ordered that the common barberry and all its horticultural varieties be removed and destroyed from all lands of the state of Indiana by December 31, 1919. The penalty is a fine of not less than \$10 and not more than \$300 for each offense to which, may be added imprisonment in the county jail for not less than thirty days and not more than six months. It should be noted here that the Japanese barberry (*Berberis thunbergii*) is not included in this order as it is not known to be a host of the black stem rust.

The order follows:

Whereas, The common barberry (*Berberis vulgaris*) and all its horticultural varieties, including the purple-leaved barberry (var. *purpurea*), are known to be capable of harboring one stage of the black stem rust of wheat, *Puccinia graminis*, which is destructive to wheat and other small grains and to grasses.

Therefore, the Conservation Commission under the authority vested in it under the acts of 1919, does hereby declare the *Berberis vulgaris* and all its horticultural varieties, including the purple-leaved barberry (var. *Purpurea*), a menace to the growing of wheat and other small grains in the State of Indiana, and does hereby order the removal and destruction of all the above mentioned bar-

berries on or before December 31, 1919. The said barberry bushes to be destroyed by the owners or occupants of the land on which the bushes are growing, and at the expense of such owners or occupants.

For violation of the above order of the Conservation Commission the penalty is provided by law (Acts 1919, page 377) of not less than ten dollars (\$10.00) nor more than three hundred dollars (\$300.00) for each offense, to which may be added imprisonment in the county jail for not less than thirty (30) days nor more than six (6) months.

Dated and signed this sixth day of November, 1919.

W. A. Guthrie, Chairman,
John W. Holtzman,
Stanley Coulter,
Richard M. Holman, Secretary
Conservation Commission.

The above rules and regulations are hereby approved by the Governor of Indiana and attested by the Director of the Department of Conservation of the State of Indiana, this 6th day of November, 1919, and said rules and regulations shall be promulgated and in full force on and after the 29th day of November, 1919.

James P. Goodrich,
Governor of Indiana.

(Seal)
Attest:
Richard Lieber,
Director of Conservation.

NOTICE.

Japanese Barberry (*Berberis thunbergii*) is not included in this order, as it is not known to be a host plant of the black stem rust of wheat, *Puccinia graminis*.

Thousands of barberry bushes have already been removed from the lands of Indiana, but thousands remain to be removed and destroyed with the complete enforcement of our new law and with the hearty co-operation of the citizens of Indiana the dangerous barberries can soon be eradicated. If Denmark can solve its rust problem by destroying the common barberry Indiana can do likewise. Destroy the barberry and protect the grain.

PROTECT YOUR TOOLS FROM RUST.

Nearly every man owns as least a few tools, such as chisels, hammers, augers, saws, wrenches, files, etc.

These tools as a rule are infrequently used. They are often kept in places where they are exposed to moisture and consequently rust. Almost all tools with the possible exception of hammers are rendered less efficient by rust.

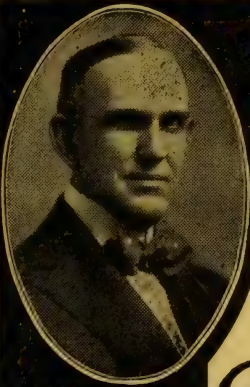
When it is so easily prevented, it seems strange that steps are not taken to do it. It is well worth while to save the tools as every one knows that has had occasion to buy any new ones lately.

Probably the best tool protector and carrying case for a small kit may be made in the shape of a roll from a piece

of pyroxyline coated fabric having a napped or fleecy back. This material is thoroughly waterproof and if care is taken in wrapping the tools in it after use, it will prevent moisture from reaching them and no damage from rust can occur.

The material is durable and will last a long time. It is obtainable at many department and general stores where it is sold under the general name of leather substitute. There are many leather substitutes on the market sold under various manufacturers' trade names. Practically any of them will answer very nicely for the use specified.

When days go wrong, remember they aren't self-starters.



**I Want You
to Know
Facts**

Ditching and Soil Washing Problems Solved

LET me show you how to solve the drainage, irrigation and soil washing problems at low cost. I'll show you how two men can now do more ditch work than 100 men by old methods. This is the year to save labor and do this work swiftly and efficiently. I'll show you the way. Write for the new book that tells the story.

THE Martin
O.D. & G. CO. REGISTERED

**Farm
Ditcher,
Terracer
& Grader**

Cuts V-shaped ditch for open drainage, irrigation or tile any depth down to 4 feet, leaves smooth, hard sides. Also use it for back-filling tile ditches and holes. Perfect machine for cleaning old weed-clogged ditches. **All steel—reversible to throw dirt either side. Adjustable for narrow or wide cut. No wheels, cogs or levers to get out of fix. Lasts a lifetime.**



**Get
This
Free
Book**

Farm Terracing

Builds farm terraces which stop washing of soil on rolling and hillside land and hold the water where it should remain; reclaims abandoned washed land; throws up dikes and levees; grades roads; works in any soil, wet or dry; 2, 4 and 6 horse sizes; large size fine for tractor. Needed on every farm.

Get Your Farm in Shape

Chance of a lifetime to make big money the next five years. Here is crop insurance at a low cost. Write and find out how to make big crops sure. New free book on drainage, irrigation and terracing. Write for this and our proposition. Address W.A. Steele, Pres.

OWENSBORO DITCHER & GRADER CO., Inc.
Box 232, OWENSBORO, KY.

**SOLD ON
10 DAYS
TRIAL**



Alumni and Local

K. W. Huffine, '20, was given honorable mention by the Boston American. He was also named among the 100 outstanding football players of the country by Charles E. Parker, who picked the All-American for the eastern paper.

E. E. Privett, '17, is an instructor in Vocational Agriculture in the high school at Morristown.

L. M. Busche, '19, is an Agricultural instructor in the high school at Monroe, Ind.

E. L. Austin, '18, is teaching Vocational Agriculture in the high school at Shelbyville, Ind.

R. L. Hammond, '17, of Indianapolis, has been appointed creamery inspector in the Creamery License Division. Mr. Hammond will assume his duties January 1.

W. H. Martin, '16, has resigned his position as Creamery Inspector and has accepted a position with the Furnas Ice-Cream Co., at Danville, Ill. He will assume duties January 1.

F. J. Birk, M. E., '22, has been chosen as captain of the 1920 football team. Birk is at present a sophomore and was one of the main-stays of the team during the past season.

Harold G. "Ty" Kolb, '17, has moved with his family to Spencer, Ind., where he is engaged in Vocational Agricultural work.

BASKETBALL

As the football season is over all eyes are turned towards basketball, Coach Lambert is expecting to turn out a good team this season. Among the men reporting regularly are Church, Coffing, Tilson, Smith, White, Campbell, Miller, Schwartz, Hurley, and many others who promise to develop into valuable material.

1920 Basketball Schedule

Jan 10—Illinois at Illinois.
Jan. 17—Ohio State at Ohio State.
Jan. 23—Indiana at Indiana.
Feb. 2—Northwestern at Purdue.
Feb. 7—Illinois at Purdue.
Feb. 14—Iowa at Purdue.
Feb. 21—Wisconsin at Wisconsin.
Feb. 25—Indiana at Purdue.
March 1—Ohio State at Purdue.

MONEY IN POULTRY AND RABBITS

We show you where to market all you raise at a profit. 62 page, illustrated book, 50 cents. None free. Co-operative Supply Co., Dept. 10, St. Francis, Wis.



SALE TAGS

We will supply you with
THE BEST EAR TAGS
on the market, for Hog Sales.

The figures are in black on an aluminum tag. They are easily read at all times. A great help to the public and the auctioneer.

25 Tags.....\$1.00
50 Tags..... 1.60
100 Tags..... 2.65

By mail postpaid.

Send cash via Registered Mail, or Postal Money Order with order.

The Purdue Agriculturist
West Lafayette, Ind.

Nunnally's

The Candy of the South

Every Box a Treat of Delicious
Sweets. We Carry a Com-
plete Line.

University Pharmacy

305 State St., West LaFayette

DEALERS WANTED

FOR THE

HOLTON TRACTOR

Plows built into the machine.

Plows square corners, finishing field as you go along.

Can't rear up in front.

One man machine for all purposes.

Economical, simple, moderate priced.

ITS STOCK A PRIME INVESTMENT AT \$12.50. LIMITED
AMOUNT AT ABOVE PRICE.

THE HOLTON TRACTOR CO.

3537 East Washington St.

INDIANAPOLIS, IND.

THE NATIONAL BANK OF RISING SUN.

Rising Sun, Ind., Dec. 5, 1919.

Holton Tractor Co.,
Indianapolis, Ind.

My Dear Sirs:

Powell and Barricklow received your tractor, all in good shape a few weeks ago.

They have been plowing with it when the weather permitted. Will say it does the work perfectly. It plows gardens better than it can be done with a team. It plows deeper and easier to get close to fence or around trees. The farmers are more than pleased with it.

I have heard a hundred farmers express themselves as to its merits and all say it is by far the most practical tractor come to Ohio County.

Wishing you success, I am

Yours truly,

JOHN R. WOODS, Cashier.



**A Wonderful New Product Takes
the Place of the Smoke House
on the Farms**

Instead of smoking your hams, sausages and meats, paint them with a smoke in liquid form. Gives meat a delicious flavor, that cannot be obtained in any other manner, makes it wholesome and exceedingly appetizing.

**"Old Gibraltar
Concentrated Smoke"**

Two coats of Concentrated Smoke, ten days apart, is generally sufficient. Your meats cured in this manner will be even more delicious than if the Old Smoke House was used. You can save yourself a world of time, and make your meats ready to market, ready to use, with scarcely an effort. "Old Gibraltar Concentrated Smoke" is put up in Quart Bottles—75 cents—Brush for applying FREE. Your nearest druggist can supply you.

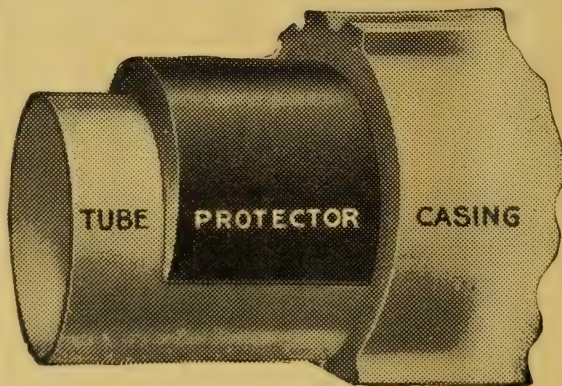
Window trim free to dealers on request.

KIEFER-STEWART CO.
Est. 1840 Indianapolis, Ind.

TRACK

The cross country track team has been making a good record this year. They recently won the state meet held at Wabash college. Notre Dame was doped to win this meet as they had one of the fastest runners of the middle west on their team, yet he was not the fastest for Furnas, of Purdue, was leading him by 300 yards at the end of the race. The run was three and one-half miles and Furnas created quite a sensation when he lowered all former records on this track almost three minutes. Purdue also won third in the conference meet held at the University of Illinois. This is an excellent record considering the speed with which Coach O'Conner put his men in shape. The members of the team are Captain Tam, Furnas, Little, Stevick, Campbell, and Kennedy.

William Butler '09, won high honors on corn at the Hay and Grain Show at the International.



COUNTY AGENTS

We have a few counties left which can be had by live-wire men that are in a position to produce.

Our Protectors will always pay big dividends to you and your customer.

IT WILL COST YOU NOTHING TO INVESTIGATE!

Coffield Tire Protector Company OF INDIANA
304 N. CAPITOL AVE. INDIANAPOLIS, IND.

**Coffield Tire
Protectors
are the talk of
the State**

The COFFIELD TIRE PROTECTOR Means Perfect Tire Protection because—

NO MORE STONE BRUISES. The Protector Cushions and Distributes the Blow.

NO MORE PUNCTURES. The Coffield Tire Protector eliminates 95% of all Punctures. PREVENTS BLOWOUTS Due to Inflation.

EASIER RIDING is the first noticeable feature after the Protectors are used.

The Best is None Too Good

*When you buy a Hatcher, buy the Best
and save money in the long run*

The Electric Hatcher

(Electrically Heated)

EXCELS ALL OTHERS



BECAUSE

- 1—It comes nearer duplicating nature than all others.
 - 2—The temperature remains the same throughout the entire hatch.
 - 3—It hatches fewer crippled chicks.
 - 4—It retains the natural moisture in the egg, which is the secret of artificial incubation.
 - 5—Can be operated without any previous knowledge of running an incubator.
 - 6—Can be converted into a brooder.
- Satisfied users in every state in the Union.
Live Agents wanted in every county in every State.

ELECTRIC CONTROLLER CO.

317-B West Maryland St.

INDIANAPOLIS, IND.

Prof. M. L. Fisher, of the Soils Department of Purdue, will discuss the growing of corn and soy beans January 6, at the Farmers' Short Course at the University of West Virginia.

IVAN S. GLIDEWELL
Spotted Poland Hogs

VERA H. GLIDEWELL
White Rock Chickens

Sunny Brook Stock Farm

PLAINFIELD, INDIANA

Feeding of Texas Bred Hereford Baby
Beeves a Specialty.

The Varsity

Rapid Shoe Repair Shop
guarantees finest workman-
ship and perfect satisfaction

Jacob Bossung

302 State Street. West LaFayette

LaFayette Milling Co.

Manufacturers of the following
brands of fine

FLOUR

"LAFAYETTE MILLING CO.'S
BEST"

"SILVER MOON"

"WEDDING CAKE"

"SNOW FLAKE"

Purdue State Bank

STUDENTS' ACCOUNTS
SOLICITED

WRESTLING

Von Bermuth recently accepted the position as wrestling coach and is very rapidly putting his men in shape. He is a Yale graduate of the class of 1917 and was Yale's heavyweight wrestler during his three years of intercollegiate athletics. During this time Yale was the eastern intercollegiate champion, and was materially helped to keep this standard by the good work of "Bill" as he is known by his more intimate friends.

1920 BASEBALL SCHEDULE.

April 24—Wisconsin at Purdue.

April 27—Illinois at Illinois.

April 30—Iowa at Purdue.

May 7—Michigan at Michigan.

May 8—Ohio State at Ohio State.

May 14—Ohio State at Purdue.

May 21—Wisconsin at Wisconsin.

May 22—Chicago at Chicago.

June 2—Illinois at Purdue.

June 5—Indiana at Indiana.

June 8 or 9—Chicago at Purdue.

national.

The Shorthorn bull, Maxwalton Marshall, was recently sold to the Franklin Shorthorn Co., of Franklin, Ind. Harry George, a former winter course student of Purdue, is secretary of this company.

Dean Skinner recently purchased a Hereford bull calf from H. L. Yost, of Kansas City, Mo. This calf was sired by Bonnie Brae 20th and stood twelfth in a class of seventy-five at the International with two half brothers standing first and second in the same class. A Shorthorn bull was also purchased from C. H. Prescott & Sons, of Tawas City, Mich. This bull placed third in his class at the Inter-

The value of a good farmers' organization in furthering extension work was shown recently in Marshall county. One township organization conducted a live-stock tour itself, obtaining extension specialists from Purdue University to assist them in the tour by addresses and judging demonstrations. Another township organization arranged for a farmers' short course to be held at Bourbon. The county agent only had to get the interested parties together.

DELCO-LIGHT

"Electricity for every Farm"

The Delco-Light engine is the **valve-in-the-head** type—used in the best and most powerful airplane engines and in hundreds of thousands of automobiles.

It is air-cooled—runs on kerosene in any climate—has only one place to oil and has a simple mixing valve in place of carburetor.

The storage battery is exclusively designed and built for Delco-Light with thick plates, wood and rubber separators and many improvements that insure long life.

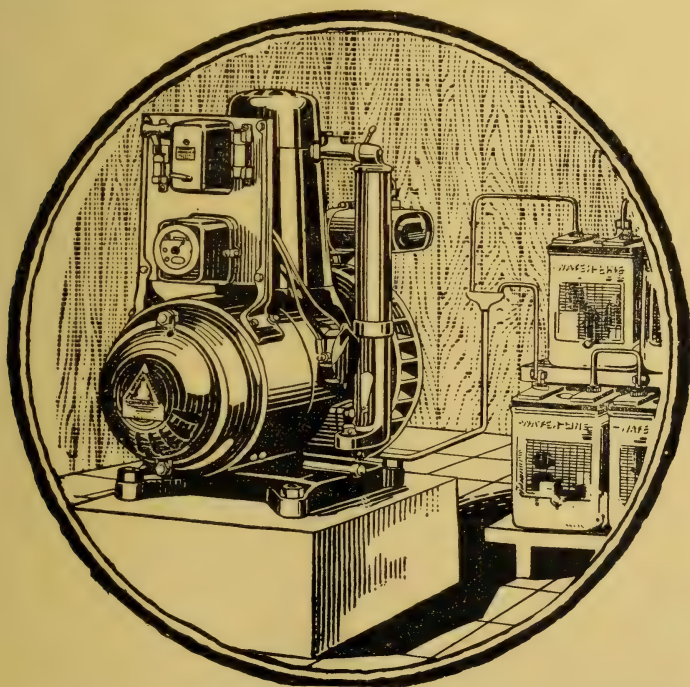
Delco-Light long ago passed the experimental stage and has gone through the refining influence of three and one-half years of production and of usage by 75,000 customers.

You will find plants in the homes of your community. Just ask your neighbor about his Delco-Light plant.

Delco-Light makes happy homes; it saves time and labor, taking away lots of hard, unpleasant tasks. It "Pays for Itself" by the work it does and the time it saves.

Of the more than 75,000 Satisfied Users of Delco-Light, the first are among the most enthusiastic—proof that the simplicity and durability of Delco-Light meets the requirements of its customers.

Over 2,500 sales and service representatives throughout the country. There's a Delco-Light man near you.



Delco-Light is a complete electric light and power plant for farms, country homes, schools, churches, stores and small towns.

THE DOMESTIC ENGINEERING COMPANY

Makers of Delco-Light Products, DAYTON, OHIO

E. L. KRUSE, Distributor, 58 to 64 W. New York Street, Indianapolis, Indiana

"LaFayette"

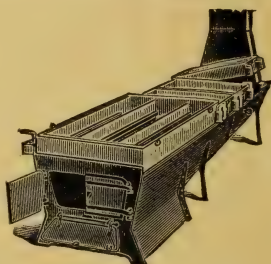
HOMINY FEED

Corn Meal
Hominy
Grits
Corn Flour, Etc.

**LAFAYETTE CORN FLOUR
MILLS**

LAFAYETTE, IND.

SAVE YOUR MAPLE TREES



There is a greater demand for Maple Syrup and Sugar than ever before. The CHAMPION EVAPORATOR saves Labor and Fuel, and MAKES BEST QUALITY SYRUP, giving BETTER RETURNS FROM YOUR SUGAR BUSH.

Write for catalogue and terms, stating number of trees you tap. Sugar Makers' Supplies of all kinds. ORDER EARLY.

CHAMPION EVAPORATOR COMPANY

HUDSON, OHIO

FROM HERE AND THERE IN INDIANA

Plans have been perfected for a pet stock and poultry show to be held at Connersville, Dec. 16 to 20. This is the first show of the kind ever held there.

Lay plans early to attend one of the short courses at Purdue University this winter and especially to take in the annual farmers' short course Jan. 12 to 16.

Thirty-eight men and a number of high school boys attended the two days' farm management short course given recently at Jeffersonville for Clarke county farmers.

Eighty per cent of the hogs sold recently at the Pure-bred Swine Breeders' association sale in Dubois county were sold to other men in that county, according to the county agent. This sale has resulted in the wider distribution of pure-bred animals in that county.

Wheat sown before Sept. 28 in Putnam county is badly infested with Hessian fly, the county agent reports. The farmers were advised not to sow their wheat before this date as they were advised the fly would attack it. Some men have lost more than 50 per cent of their crop as a result.

The Steuben County Beekeepers' association met recently and adopted a program for the development of the association's work next year. A week of demonstration and inspection was agreed on as one means of getting all bees in the county into standard hives and cleaning up foul brood, a contagious disease.

Apollo

Full weight—
Galvanized—

Roofing and Siding

Both farm and city property owners need to know the absolute safety and service of metal roofing.

APOLLO-KEYSTONE Galvanized insures durability and satisfaction for all forms of sheet metal work, including Culverts, Tanks, Flumes, Spouting, Garages, etc. Sold by leading metal merchants. KEYSTONE Copper Steel is also unequalled for Roofing Tin Plates. Look for the Keystone added below regular brands. Send for free "Better Buildings" booklet. AMERICAN SHEET AND TIN PLATE COMPANY, Frick Bldg., Pittsburgh, Pa.



Don't Buy Serum——Buy Immunity

Any one can make an anti-hog cholera serum—you could do it yourself if you knew how.

But when you had done it, how would you know there were no deadly poisons in it—no abscess-forming bacteria that would make your product do more harm than good?

How would you know your serum was **effective**—that it was positively potent?

There can be no doubt on those points as to **our** serum because every lot of

PITMAN-MOORE
TRADE MARK
Anti-Hog-Cholera Serum[®]

is tested for purity, for potency, for freedom from contamination, by much more stringent and certain tests than those prescribed by the government and used by other serum producers.

That is why you can not afford to use any but Pitman-Moore Serum—that is, if you want to be sure you are taking no chances.

This serum is administered by licensed, graduate veterinarians only.

PITMAN-MOORE CO.

111-117 NORTH CAPITOL AVE., INDIANAPOLIS, IND.

TO BE EXPECTED

You possibly have wondered why dairymen who use



are so much more successful and prosperous than those who do not. There is nothing unusual about this when you consider the many advantages that are derived from the use of this material.

This cleaner thoroughly removes all objectionable and fermentative matter from dairy and creamery apparatus, leaving it pure, sweet, sanitary and clean, which is the condition most desired for the production of dairy products of the highest quality. It also proves to be an economy of considerable importance, because of the saving in time, labor and cleaning material necessary to fully accomplish your cleaning needs.

Order from your supply house.
It cleans clean.

Indian in
circle



in every
package.

THE J. B. FORD CO.,

Sole Mnfrs., Wyandotte, Mich.

REAL FEED REQUIRED TO MAKE PRIME LAMB

Grain, Leguminous Hay, Silage and Cottonseed Meal Make Best Ration.

By Claude Harper.

Through the corn belt this year feeder sheep and lambs have been taken out liberally by farmers having a large amount of roughage for consumption. Many of these lambs that have gone out will be fed almost entirely within the fields. They will consume a lot of waste feed, clean up the corn fields and owing to the lack of shelter will be returned to market as soon as the first snow flies.

This has been the Iowa and Illinois system of feeding lambs for several years and as a result the warmed-up stuff that comes to market is seldom fat enough to meet the keen demand. Beginners should realize that such a method seldom makes prime lambs. For those who want to produce market toppers, it has been pretty well demonstrated that such sheep or lambs must have some harvested feed, consisting of grain, a leguminous hay and if available, silage and cottonseed meal.

Purdue University's standard ration which consists of seven parts of shelled corn, one part of cottonseed meal, clover hay and silage has given an average daily gain of .328 pounds in ten feeding experiments from 1911 to this year. The average initial weight of the lambs fed was 57.9 pounds; the average final weight 87.5 pounds, and the gain per lamb during the feeding period being 29.6 pounds.

Here is how much the average daily feed per lamb was: Grain 1.16 pounds; cured roughage .94 pounds, and silage 1.39. The feed required per pound of gain was 3.53 pounds of grain, 2.81 pounds of roughage and 4.27 pounds of silage, making the combined cost per hundred pounds of gain \$7.92. The average profit per lamb during the eight years was \$1.17. The University has topped the market several times.

Farmers can not cope with city people in the struggle for a square deal with an inadequate and antiquated country school system. Education is one of the principal factors in this struggle.

HOMCO PIG AND SHOAT FEED

Pigs root for elements essential to growth that are not always present in the soil.

HOMCO Pig and Shoat Feed is a highly concentrated ration to the degree of furnishing in natural form elements necessary to rapid construction of a big well-covered frame.

HOMCO Pig and Shoat feed insures a short feeding period and minimum shrinkage in shipping. Each ingredient an ideal pig feed if fed alone. Write us for sample.



A Complete Balanced Ration Developing Feed. For Brood Sows, Pigs and Shoats. Write for Sample. "Homco" means Quality. Quality means Economy.

American Hominy Company

Indianapolis, Indiana.

HAYWOOD PUBLISHING COMPANY

LaFayette, Indiana



If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

A rural school fair held recently in Butler township, DeKalb county, attracted many farmers and their families. The work was done by the student and teachers. As a result of the fair, a strong sentiment has been created for the consolidated school.

A series of nine laboratory lessons in agriculture have been worked out by the Orange county agent and superintendent of school and sent to each rural schools in the county to assist in the teaching of agriculture.

WINTER MANAGEMENT OF THE BROOD MARE

(Continued from Page 179)

A grain ration that is considered a standard consists of oats and bran—one-fourth or even one-third by weight of bran.

With each of these suggested rations should be included bran, roots, or linseed oil meal to keep the alimentary tract in good condition. No hard and fast rule can be made regarding the amount of feed. The tendency is to feed too much hay rather than too little. Feed only what they will clean up with relish. Any day the mare is not taken from the stable the grain ration should be cut from one-third to one-half.

Especial care must be exercised to avoid moldy hay or silage, damaged grain and woody or weathered corn fodder. Precaution should be taken when the mare is pastured in a stalkfield in order that she may not become ergotized and thereby caused to abort. Judgment must also be used in changing feed. If it becomes necessary to make a change it should be done gradually.

By providing ample feed of the right sort and plenty of exercise or moderate work the mare will come through the winter in the pink of condition and at a minimum cost to the owner. And it is only by maintaining the proper balance between feed and exercise that we can confidently expect the mare to be in fit condition for the ordeal of foaling and for the spring work.

In addition to the above, a few general rules are to be observed in the proper

Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

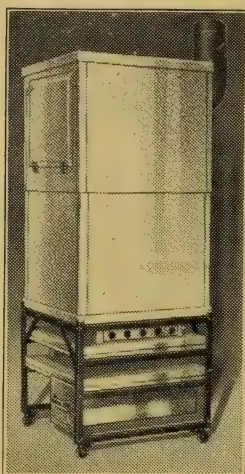
ACME-EVANS COMPANY

Indiana's Largest Millers

INDIANAPOLIS, IND.

Hickory Smoke House

Also Sanitary Storage for Smoked Meats



FARMERS

use them to
smoke their

Sausage, Bacon, and Hams

Also to keep
meat in so it does
not mold and free
from insects.

The Hickory
was the First
Smoke House in-
vented to take
the place of the
old way of smok-
ing meat. Other
similar Smoke
Houses are in-
fringements on

Patents
No. 1166146
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Write for free book. 30 days free trial.
Built in 10 different sizes.

HICKORY SMOKE HOUSE CO.,
MILFORD, INDIANA.

care of the brood mare during the winter months.

1.—Icy lots or crowded paddocks are to be avoided, as a slip or a kick may result in abortion.

2.—A light, well ventilated, clean, and well bedded stall should be provided for the brood mare. A box-stall is always preferable.

3.—Regularity and kindness in handling are essential factors of proper management.

4.—Constant attention to details and a natural love for horses, especially the brood mare, are necessary attributes of the successful horseman.

1617 BOYS AND GIRLS IN INDIANA PIG CLUBS.

Sixteen hundred and seventeen boys and girls in Indiana belong to pig clubs and each one is raising from one to 20 pigs with the average having three. These figures compiled by Purdue University show what is being accomplished by the Hoosier youngsters in the way of live stock promotion.

“MADE IN INDIANA”

Kingan's Digester Tankage

(HOG FOOD)

Manufactured in accordance with the Indiana Feeding Stuffs Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining “KINGAN'S” Digester Tankage of your dealer.

KINGAN & CO. LTD.

BEEF AND PORK PACKERS,
INDIANAPOLIS, IND.

Cut Down Your Cost

A NUMBER of the most successful dairymen testified before the Federal Milk Commission, which has been fixing the price of milk from the producer to the consumer, that they had cut down their costs of production by feeding Corn Gluten Feed and wheat bran freely in grain rations they mixed themselves.

The Commission must have been convinced by what these representative good dairymen had to say about different feeds and the economy of a man's mixing up his own rations.

For, in arriving at the price it thought the dairyman ought to get for his milk, the Commission based its calculations on home-mixed rations in which Corn Gluten Feed was a principal basic ingredient.



If you have not yet fed Buffalo Corn Gluten Feed, if you want to know more about how to feed it, and your dealer doesn't happen to have it, write us—giving his name.

Corn Products Refining Company

New York

Chicago

THE FEED THAT MAKES THE YIELD

For Farm Butter & Cheese Making

HANSEN'S Dairy Preparations

Pure, concentrated, ready to use, absolutely reliable, giving uniformly best results in the country's finest creameries and cheese factories.

For Cheese-Making: Hansen's Rennet Tablets, Junket Tablets (for Cottage Cheese), Cheese Color Tablets.

For Butter-Making: Hansen's Danish Butter color (4 oz. and 1 oz. bottles), Hansen's Butter-milk Tablets or Lactic Ferment Culture for perfect ripening of cream for butter and milk for cheese and commercial buttermilk.

Sold by drug and dairy supply stores, or direct by

**CHR. HANSEN'S LABORATORY,
Inc.,
Little Falls, N. Y.**

Interesting treatise "The Story of Cheese" by J. D. Frederiksen, free on request.

THE STORY OF FYVVIE KNIGHT

(Continued from Page 187)

meat that induced M. Clemenceau to take three helpings. The maitre de hotel said that it was a surprise to him to see a dish so thoroughly cleaned up in a meal where there were so many dishes to follow.

"Mme. Poincaire, before the time of the banquet, asked for a steak for the President's private table; she also asked for the chuck so that she could give it to one of the Paris hospitals, in which she is interested. All in all, it might be said that, as far as food was concerned, this piece was the honor piece of this historic event."

The American Consul General of London reports that American condensed milk is not in favor just now in the Kingdom, owing to the fact that it does not keep very well after the can is opened. Some steps should be taken to correct this trouble if possible. The British Food Controller fixed the price of milk at 24 cents per quart for the winter.

—U. S. Bureau of Markets.



Saves \$50 Every Month

One dairyman who feeds International Special Dairy Feed in place of wheat feeds saves approximately \$50 per month on a herd of 50 cows, and *gets more milk*. What would a saving like this mean to you? Don't envy the extra profits others are making. Use International Special Dairy Feed and get 100% milk flow from your cows.

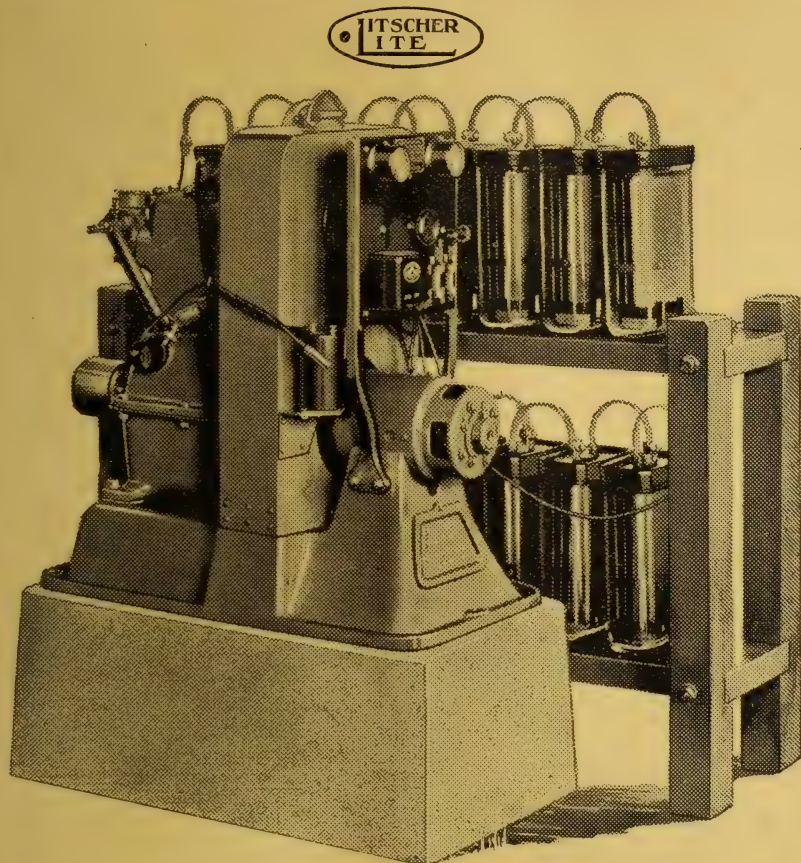
International Special Dairy Feed Makes More Milk

Every day brings us letters from dairymen praising the high quality of this famous ration. These letters contain such statements as "It produces more milk at less cost," "Won Gold Medal," "Never found its equal," "Got more milk than with any other feed." Statements like these point the way to bigger profits from your herd.

International Special Dairy Feed is a scientifically mixed ration, containing choice grain products, cottonseed meal and molasses. It is guaranteed to satisfy you. Order a trial ton from your dealer. The results will both surprise and please you.

INTERNATIONAL SUGAR FEED CO., Minneapolis, Minnesota
Mills at Minneapolis and Memphis





The **Litscher Lite** Plant is started by a push of a button, and runs on kerosene. One gallon of kerosene will run a **Litscher Lite** Plant for several hours.

The **Litscher Lite** Plant has two full H. P. in excess of its dynamo requirements. When the dynamo is idle, four H. P. are at your command for running any belt driven farm machinery. In other words the **Litscher Lite** Plant is an electric lighting plant and a stationary power plant combined.

Litscher Lite will operate electrically or by belt transmission any labor-saving device in house or barn.

The Varney Electrical Supply Co.

(INCORPORATED)

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SEND TO DEPT. P. A. FOR BOOKLET AND SPECIFICATION SHEET—FREE

Quality Goods Direct From Factory



We save you money on Fence, Gates, Posts, Paint, Roofing, Tanks, Troughs, Fountains, Feeders, Tank Heaters, Silos, Metal Cribs, Wagons, Cultivators, Pulverizers, Harrows, Discs, etc.

Satisfaction guaranteed or money refunded.

Write today for FREE catalog.

STANDARD SUPPLY HOUSE

36 W. Logan St.

NOBLESVILLE, IND.

THE STOCK JUDGING TEAM.

(Continued from Page 190)

sities were represented from all over the United States and Canada. Twelve classes of stock were judged and reasons given on eight of these classes. Texas, Nebraska, Iowa, Kansas and Purdue was the order in which the teams finished. Purdue was second on sheep judging and no where did many points separate her from the top.

The team which was coached by Prof. W. W. Smith was made up of H. F. LaFuse, M. R. DeVoe, S. D. Sims, H. W. King and M. L. Hall, with R. G. Reiff and C. Crosby as alternates. Other members of the team, though not as successful as Sims individually, did consistent work which enabled the team to place fifth and creditably represent Purdue.

The man who sidesteps his obligations is apt to find his path a muddy one.

If your work worries you it is evident your position is a little larger than you are.—W. C. Hunter.

Reliable Heater Fountain

WARM WATER IN ZERO WEATHER

All feeders are agreed that plenty of fresh, warm water is essential to successful winter feeding of hogs.

Realizing this growing need we have equipped our famous **RELIABLE FOUNTAIN** with a lamp heater and are offering it to the trade under the same guarantee as our summer fountain. Made from very heavy gauge galvanized iron, has no valves or floats, nothing to get out of order.

Demand the best. Ask your dealer to get prices. Prompt delivery.

Crawfordsville Wire & Nail Co.

CRAWFORDSVILLE, IND.

MISTER FARMER!

*How long are you going to let Dobbin
eat profits from your wallet?*

Thomas Edison says: "A horse is the poorest motor ever built. He eats the output of five acres, and yet his thermal efficiency is only two per cent."

BUY A

FORDSON FARM TRACTOR

MADE BY

HENRY FORD & SON, Inc.

AND SAVE

TIME, LABOR and MONEY

It is estimated that the horse works 100 days a year. The Fordson works the year round. Plan your work ahead.

*The Fordson Tractor and the Stover No. 40 Feed
Mill make a fine combination*

SEE YOUR FORD DEALER

FORDSON CALENDAR.

January Corn shelling, feed grinding, straw baling, wood sawing.	February Corn shelling, baling, feed grinding, wood sawing.	March Plowing, discing, rolling wheat, dragging roads, stump pulling.	April Plowing, discing, cultipacking, drilling, road building, manure spreading.
May Plowing, discing, cultipacking, harrowing corn.	June. Harvesting, hay loading and hauling, baling.	July Harvesting, threshing and hauling, hay baling.	August Clover hulling, threshing, plowing, discing, cultipacking corn.
September Drilling, cultipacking, silo filling, hulling clover.	October Plowing, seeding, baling, clover hulling.	November Corn shredding, fall breaking, feed grinding.	December Corn shelling, feed grinding, corn shredding, straw baling.

Felt Hats, Cloth Hats, Caps and only the best of Furnishings



THE HUB

B. & J. Hirsh

West Side Square

ROVER'S ROVINGS

(Continued from Page 196)

steps a queer looking man who said he would show us some sleight of hand. I didn't think that he could fool me on any of his tricks but pretty soon he began to sneeze and then three white pigeons came right out of his mouth. That got me interested and then in a little while Mr. Frederick the Great began going around to the boys and taking money out of their noses and eyes. I reached in my pocket and grabbed mine for I only had enough to get home on. He got nearly a hat full of the money and I thought that he must have an easy way to get rich. I wondered what the boys were going to do about the money he had taken away from them, but they told me that their's was all there and I found out that Mr. Frederick was only fooling after all. I still wonder where he got that money though.

That night we came home but we were well satisfied and happy for Clara Ray, one of our club girls from Mellott, Ind., won the Grand Championship in the Junior Feeding Classes with her grade Short-

FOUNTAIN
PENS
WATERMAN
CONKLIN
SCHAEFER

College
Jewelry

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OF THE
LATEST
EDITION
SECOND-HAND
BOOKS BOUGHT

Have
Your
Films

Developed
Here

Our Fountain Service is Unex-
celled. Our Malted Milks
Satisfy.

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Student Store

STATIONERY
THAT HAS
ORIGINALITY
QUALITY, STYLE
and
STANDARD IN
PRICE

College
Pennants

CAMERAS
ANSCO
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and
EASTMAN
FILMS

Manufacturers of
Indiana Farm Wagons,
Farm Trucks and
Extra Boxes

State Agents For
Master Trucks
1½ to 5 Ton Capacity
Winton and Scripps-Booth
Six Cylinder Automobiles
Write For Prices

The Indiana Wagon
Company

South Street and Belt Railway, LaFayette, Indiana

MURPHEY-BIVINS CO.
PRINTERS
LA FAYETTE, IND.





Letter Heads, Office Supplies
 Social Stationery
 Visiting Cards
 Announcements
 Invitations
 Programs a Specialty

**STOCK SALE CATALOGS A
SPECIALTY.**

horn "Buster." We all felt proud to walk with her while she was wearing the big blue ribbon and think that we all lived in Indiana. We felt all puffed up to think that one of our own members had beaten all of the boys and girls from Iowa, Illinois, Missouri, Nebraska, Oklahoma, Texas, Mississippi and Georgia. She felt proud too and I didn't blame her a bit either. If I would win a prize like that I'd think I was some dog. Every one of the boys and girls said that they sure had a fine time but I think I had the best time of all for I was the only educated dog that has ever been to the International. Jack and I are going rabbit hunting. Don't forget to write. ROVER.

HOME ECONOMIC CLASSES IN INDIANA.

(Continued from page 200)
 because of the interior decorations, heating, lighting and water systems.

"Since poultry is of interest to every farm woman, a stop at a poultry farm was made.

"This was a most interesting trip to

AGRICULTURAL LIMESTONE



WRITE FOR SAMPLE AND PRICE

A. & C. Stone and Lime Co.

GREENCASTLE, INDIANA.

RIDGEVILLE, INDIANA

General Office
 INDIANAPOLIS, INDIANA.

DAIRYMENS' BULLETIN BOARD

FEED ENOUGH

Two Words That Spell P-R-O-F-I-T For Dairymen

Do you know that 90% of the dairy cows of America are underfed?
Do you know that nine out of every ten dairy cows would be **BETTER** producers if they were fed the proper ration to the limit of their capacity? Try this experiment and see for yourself the increased milk production you will get—begin feeding

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

to your milking herd, two parts Schumacher and one part Big "Q," in the same amount you usually feed, together with ensilage or other roughage. After three or four days, begin increasing the amount 1 pound per cow at each feeding and keep increasing as long as each cow increases her milk production, until she has reached her maximum flow. Some of your cows will handle more feed than others. Watch the results on each individual cow and feed each cow to the limit—the increased milk production will repay you many times the cost of the additional feed. Mr. Fred Lehman, of Carlisle, Pa., proved that maximum feeding increased his profits \$25.30 during April from 4 cows.

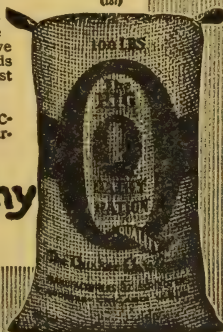
SCHUMACHER FEED and BIG "Q" Dairy Ration fed in combination will solve your feeding problem, and if fed as directed will insure maximum production and profits.

These feeds make feeding easy, economical and accurate. SCHUMACHER FEED (the carbohydrate ration) and BIG "Q" (the high quality protein ration) have unusual palatability, high digestibility and nutrition. Thirty-five World's Champion Dairy Cows have made their World's Records with these feeds—undeniable proof that they are the greatest dairy feeds in the world. Your dealer can supply you.

Write for **FREE** Folder, "Long Time Milk Production and How to Get it"—also tells how to feed dairy cows during entire lactation periods for best results.

The Quaker Oats Company

Address: CHICAGO, U. S. A.



...The... Zinn Store

is emphatically a

Store for Men

Absolutely no better or
safer place to buy

SHIRTS, NECKWARE,
HOSIERY, GLOVES,
UNDERWEAR.

all, and every woman went home with something interesting to think about, and something she could apply in her own home."

The annual meeting of the Home Economics classes will be held at Purdue University, Thursday, January 15, 1920, during Farmers' Short Course week.

A record breaking attendance is expected, and reports from representatives of the various classes will be given. This meeting is open to the general public, come and learn of the splendid work these organizations are doing.

RURAL CONDITIONS IN WESTERN EUROPE.

(Continued from Page 202)

Orchards receive less care than do woodlots. Mistletoe is a very serious pest, the apple trees especially suffering from this parasite. Many orchards were destroyed by it during the war. Vineyards are to be found upon the rocky hillsides, where orchards will not flourish. The care of these is a very dangerous occupation as the slope is very steep and a fall will almost certainly result in death.

Over Forty One Million Dollars!

An enormous sum
—and yet,
large as it is—

We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the **SEVEN** largest Live Stock Commission Houses on the Chicago Market and we are also one of the **SEVEN** largest Houses on the Kansas City market.

We sell the experimental and fat cattle for the Animal Husbandry Department of Purdue University, Illinois State University and the Missouri State University and also the Experimental cattle from Worcester, Ohio.

LET US HANDLE YOUR NEXT SHIPMENT

Alexander Conover & Martin

LIVE STOCK COMMISSION

U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

“He’s the Best Farm Hand We Ever Had”

Haven’t you often heard your father say that about one farm hand—the “old reliable” who is always on the job, doing more and better work than any of the others?

If your father knew that he could get all the farm hands he needed, each of them as good as that “best” one, he would grab at the chance, wouldn’t he?

When you begin operating your farm, after leaving school, you will hire fewer farm hands than your father does, but you will buy more farm machinery. You will have an opportunity that he didn’t have in hiring labor. You can be sure of reliability in all of your implements and machines.

The John Deere line is like a complete force of reliable farm hands. It is comprised of an implement for practically every farm operation. It has been a leader in quality for over three-quarters of a century. The success of the whole line is due to the high quality for each unit in the line.

Be sure to investigate the John Deere full line before you begin your career as a farmer. You will want the uniformly high quality that it insures.

John Deere,

Moline, Illinois

I wish to thank

Agricultural Students of Purdue University for their past and future patronage.

“Deac”

H. G. REISNER,
Student Supply Store.

Carson's Drug Store

KODAK FILMS
DRUGS AND
SCHOOL SUPPLIES

306 State St., West LaFayette



Kodaks Eastman Film Quality Finishing

Conducted by a Purdue Man for
the Satisfaction of Other Purdue
Men.

The Foster Shops

Opposite the Campus,
West Lafayette.
West Side Square, Lafayette

College Footwear

of all descriptions
for all occasions

—FOR—

Co-Eds
Students and
Faculty

The Varsity Boot Shop

302 State St. West LaFayette

Jaques & Southworth Company

STUDENTS'
DEPARTMENT STORE

308-10 State Street

WE CAN SAVE YOU MONEY ON
BOOKS

Big Stock of Second Hand and
Slightly Used Books

DRAWING INSTRUMENTS and
all STUDENTS' SUPPLIES

Gents' Furnishing Goods,
Confectionery and Cigars

SPECIAL FOUNTAIN SERVICE.

Deposit your Money with Us—
No Charge.

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ag. Sem.



The PURDUE AGRICULTURIST

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FEB 11 1920
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FEBRUARY, 1920



Vol. 14 No. 5



A large sack of Purina Pig Chow, 100 Lbs., featuring a black and white checkered pattern. The sack is shown from a slightly low angle, emphasizing its size. It has two small ears or handles at the top. The text "100 Lbs." is printed above the brand name "PURINA PIG CHOW" in a bold, sans-serif font. The sack is filled with a dark, textured material, likely the pig chow itself.

Purina Mills, St. Louis, Mo.
Ft. Worth, Tex. Nashville, Tenn.
Brooklyn, N. Y.

	SIX BUSY MILLS	
HORSE DAIRY POULTRY	PURINA FEEDS	SWINE STEER CALF
	CHECKER BOARD BAGS	

**Don't take chances
on losing your pigs!**

**TREAT YOUR PIGS NOW—
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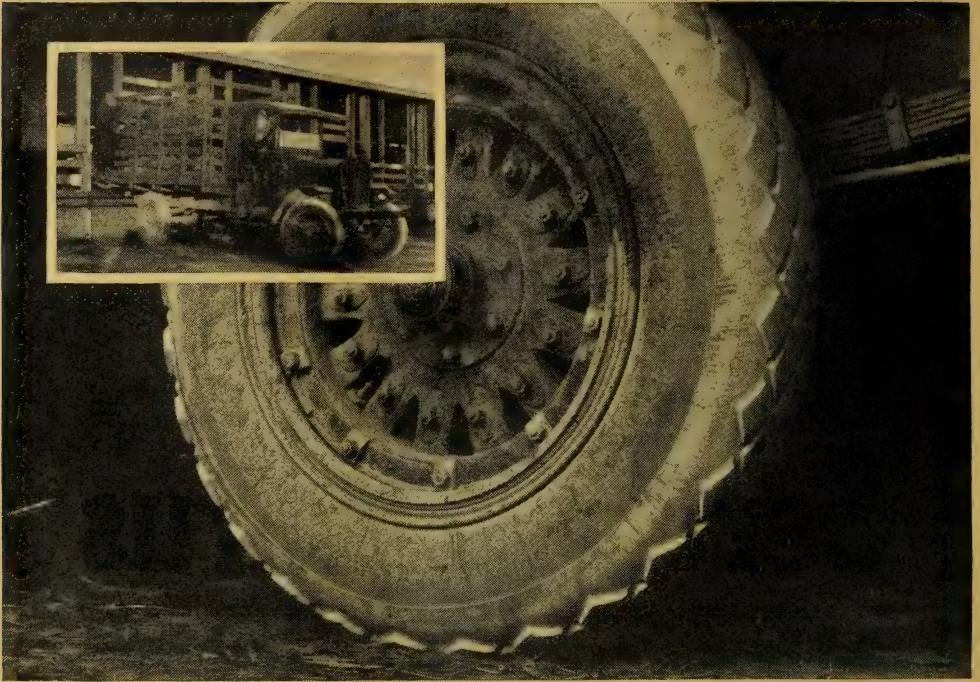
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GOODYEAR



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Three beauties belonging to the Gossard breeding estates, Martinsville, Ind.

THE PURDUE AGRICULTURIST

VOLUME XVI

FEBRUARY, 1920

NUMBER 5

The Dairy Department

By Prof. O. E. Reed,
Chief of Dairying.

THE work of the Dairy Department of Purdue University and the Experiment Station is divided into three principal lines, namely, teaching, investigation and Extension work. In addition to these duties the Department is also charged with the enforcement of the Creamery and Testers' License Law and also has supervision of the official testing of pure bred dairy cattle in the state of Indiana.

other creameries of its size in the state and serves to bring the students as well as the teachers, in direct contact with the practical and every day problems encountered in this line of work. The Dairy Farm serves the same purpose in the administration of the courses along production lines. The equipment on the Dairy Farm includes a herd of dairy cattle, consisting of representatives of the four principle dairy breeds.



Creamerymen taking Short Course at Purdue University, 1919.

The instructional work at the University includes the administration of courses relating to commercial dairying such as buttermaking, creamery management, ice cream and cheese making, also courses relating to dairy farming such as dairy cattle, feeding, breeding and dairy farm management. In order to facilitate the work along these lines the University maintains and operates a commercial creamery and a farm, given over entirely for work of the Dairy Department. The Purdue Creamery is operated on a commercial basis in the same manner as

Students in the four year course and in the several Short Courses may specialize in any of the courses offered. The training offered in the four year course is designed to give the student a fundamental training that will help to fit him for management or operation of a factory or dairy farm. There is a constant demand for men trained along these lines.

The investigational work of the Department includes experiments with dairy cattle and problems relating to the dairy farm. The members of the Dairy Staff divide their attention between the teach-

ing and experimental work. The results of such investigational work are published by the station in bulletin form and distributed to those interested.

The Extension work in dairying is carried on by a separate force of men. Their work includes the attending of dairy meetings and short courses held at various places throughout the state, the organization of cow testing and pure bred sire associations and calf clubs. Assistance is also given by these specialists in buying dairy cattle for the farmers desiring help along this line.

inspect their places of business from time to time. The manufacturing plants are licensed and a report is made by each plant of the total amount of dairy products manufactured during the year and this makes it possible to calculate the output of dairy products in the state.

All glassware that is used for testing milk and cream in the state is required to be inspected. This inspection is done in the Dairy Chemistry Laboratories.

All official records made with pure bred dairy cattle in the state are supervised by the Dairy Department. These records



Imported Guernsey calves which were distributed among the members of the Lebanon, Ind., Boys' Calf Club.

The Dairy Department of the Experiment Station is charged with the administration of the Creamery and Testers' License Law. The purpose of this Law is to insure correct butterfat tests to the producer and manufacturers of dairy products. Every operator in Indiana, buying cream or milk on the butterfat basis is required to pass an examination which is given to ascertain his or her proficiency in testing milk and cream. These operators are licensed and held responsible for correct testing. There are now, some 1800 men and women buying cream throughout the state. The men of the Creamery License Division give the examinations to these operators and also

are divided into two classes, short time records, or periods of seven to ninety days are called official records, and yearly records are termed semi-official or authenticated records. When notification is received from a breeder, desiring to make official tests on his cows, the Department sends a qualified man to the farm, who remains there for a definite period, overseeing the milking, weighing the milk from each cow, sampling each milking and testing it for butterfat by the Babcock method. This report is returned to the Dairy Department and then forwarded to the secretary of the breed association. When semi-official tests are made, the supervisor weighs and tests the

milk at each milking for a period of two days. The average butterfat test obtained for the two days is used as the average for that month. The breeder keeps a complete record of all milk produced for each day during the month and reports

same to the breed association. With this information at hand, the monthly estimate of butterfat is calculated and this continued each month throughout the year. All costs of supervision are paid by the breeder.

1920 Farmers' Week is Great Success

THE most successful short course in the history of Indiana was held the week of January 12 to 17 at Purdue University, when between 1800 and 2000 farmers from throughout the state gathered for the seventeenth annual agricultural round-up.

"The sentiment shown at the various meetings and the tone of the statements of men from throughout the state shows that Indiana farmers have their feet on the ground and are going forward in a big way," said Prof. G. I. Christie, superintendent of agricultural extension, and former assistant secretary of agriculture. "However, they are not content to simply farm and allow profiteers to handle the products. Indiana farmers are organizing and will demand a square deal."

In connection with the short course, ten state agricultural associations held their annual meetings, and three shows, the state corn show, a ham and bacon show and Purdue apple show were held.

Edward Lux, of Shelby county, a brother of the 1919 national corn champion, won the highest honors in the corn show with a 10 ear sample of Johnson Country White. G. W. Lewis, Wingate, won the honors in the single ear class with a sample of Reid's Yellow Dent corn. Charles Short, of Greensburg, won sweepstakes honors in the yellow corn class with his sample of the same kind of corn. A. F. Troyer, of Lafontaine, took sweepstakes in the mixed corn class, while Joseph C. Isley, another Shelby county man, won sweepstakes honors in the oats class, and William Tritch, Co-runna, in the wheat classes.

Preston Moody, of near Fremont, Steuben county, a 14 year old boy, was found to be the junior corn growing champion of Indiana, winning the boys' one acre

contest by producing 147.3 bushels of corn on his one acre tract.

In the ham and bacon show, Elmer Cutsinger, of Edinburg, showed first prize meat in both these classes. At the auction at the close of the course, Cutsinger's ham sold for \$1.05 per pound and his bacon brought \$1.14. Proceeds from the sale of the meat were donated toward the show for next year.

Honors in the apple show went to R. B. Simpson, of Vincennes, in the commercial growers' class.

Corn Growers' Meeting

At the annual meeting of the Indiana Corn Growers' Association, Marshall Vogler, of Hope, one of the best known corn men in the state, was named president; C. A. Brown, Franklin, vice-president; G. I. Christie, secretary-treasurer; and district vice-presidents, I. W. Schultz, Howe; Roy Snoeberger, Rockfield; J. S. Helms, Richmond; Harry Elrod, Mitchell, and E. W. Hammond, Rockport.

Resolutions were adopted urging employers and employees in the industrial world to get together and produce their utmost the same as the farmers were trying to do, and help bring the world back to a normal basis. Another resolution endorsed the Indiana Federation of Farmers.

Livestock Breeders' Meeting

E. J. Barker, Thorntown, was named president of the Indiana Livestock Breeders' Association to succeed Will Johnson, of Fort Wayne. E. M. Wilson, Anderson, was elected vice-president; F. G. King, Purdue, secretary-treasurer; J. W. Van Natta, Lafayette, and S. R. Claycomb, Portland, members of the executive committee.

Indiana State Dairy Association

B. H. Scranton, of Rising Sun, was named president of the Indiana State

Dairy Association; W. L. Hanning, Evansville, vice-president; C. R. George, Purdue, secretary-treasurer. The association adopted resolutions urging that more money be obtained for a continuation of the campaign for accredited tuberculosis free herds of cattle.

Indiana Shorthorn Breeders' Association

Dr. A. E. Harlan, Alexandria, was re-elected president of the Indiana Shorthorn Breeders' Association. R. C. McMillen, Fort Wayne, was chosen vice-president, and W. B. Krueck, Purdue, secretary-treasurer. Will Johnson, Fort Wayne, was named representative to the Indiana Livestock Breeders' Association. The Shorthorn men made arrangements for the state fair futurity contest, for a banquet to be held at Fort Wayne in April; a picnic during the summer and an association sale to be held later.

Sheep Breeders and Feeders

L. J. Foster, Crawfordsville, was named president of the Indiana Sheep Breeders' and Feeders' Association to succeed U. R. Brouse, of Kendallville. Claude Harper of Purdue was re-elected secretary-treasurer. The sheepmen heard addresses by Prof. W. C. Coffey of the University of Illinois; Allen M. Lewis, Montgomery county, Ind., one of the most successful sheep raisers in the state, and Mr. Harper.

Indiana Ayrshire Association

Ayrshire breeders formed a new state organization, electing H. E. McCartney,

Martinsville, president; C. C. Richards, Oaklandon, vice-president; T. W. Hart, Valparaiso, secretary-treasurer. J. H. Fry, Charlestown, and M. A. Ritter, Valparaiso, were elected to the executive committee. The association arranged for a futurity show at the state fair and will push boys' and girls' club work.

Indiana Jersey Cattle Club

O. H. Baker, of the American Jersey Cattle Club, spoke to the Indiana Jersey Cattle Club. The Jersey men made plans for a complete census of all Jersey breeders in the state. W. H. Senour, Brookville, president; I. V. Calvin, Kewanna, vice-president, and C. Earle Smith, Indianapolis, secretary-treasurer, all were re-elected. Ainsworth Bassett, Mrs. M. A. Covode and J. A. Driscoll were named on the board of directors.

Indiana Holstein-Friesian Association

Thomas Kenne, Hobart, was named president of the Holstein-Friesian Association; B. V. Morgan, Chesterton, vice-president; W. L. Hanning, Evansville, treasurer, and H. A. Moss, Center Point, secretary. T. J. Martin, Aurora, was put on the executive board.

Indiana Guernsey Breeders

Officers of the Guernsey Breeders' Association were re-elected. They are E. L. Jones, Warren, president; W. O. Mills, Martinsville, vice-president; Robert McNagney, Columbia City, secretary-treasurer.

Cooperation in Tillamook County, Oregon

By Prof. P. S. Lucas.

TILLAMOOK County, Oregon, is justly noted for its cooperative dairy enterprise and the material benefits that have accrued therefrom to the farmers concerned. Located one hundred and twenty miles southwest of Portland and eighty miles down the coast from the mouth of the Columbia River, the county is bounded on one side by the sea and on the other three by the Coast Range Mountains. Much of it is mountainous but numerous small fertile valleys stretch their length octo-

pus-like into the surrounding hills making of the section an ideal stock country.

Despite the stories carried to the outside world by Indians and trappers, of Tillamook's rich valleys, luxuriant meadows, mild climate, and cold mountain water, it was not until 1854 that the pioneer reached there. A very few years ago a railroad was built into the county to utilize her fine spruce and fir timber. Until then trails and a wagon road over the mountains served as sole means of communication with the outside world,

except for the occasional schooner that visited her lonely harbor. Because of this very isolation dairying proved a type of farming well adapted to the region. Every natural advantage also favored it. A mild climate, abundance of rain, and fertility made for low cost of stabling and feeding, and combined with the advantage of an abundance of cold water made an excellent quality of milk easily possible. Dairy herds increased and Tillamook butter shipped in casks by boat soon found its way to, and was favorably received on, the Portland markets.

These collectively supply their plant with 6,000—30,000 pounds of milk. Shares range from \$10.00 up, but each member is entitled to but one vote no matter how many shares of stock he holds. Each patron agrees to deliver a good clean product and by a certain time each morning. He cannot on account of grievance shift his product from one factory to another unless by the consent of the other shareholders. This has served the cheese makers as a useful weapon in keeping the milk supply up to standard without losing patronage.

The presidents of the twenty-four fac-



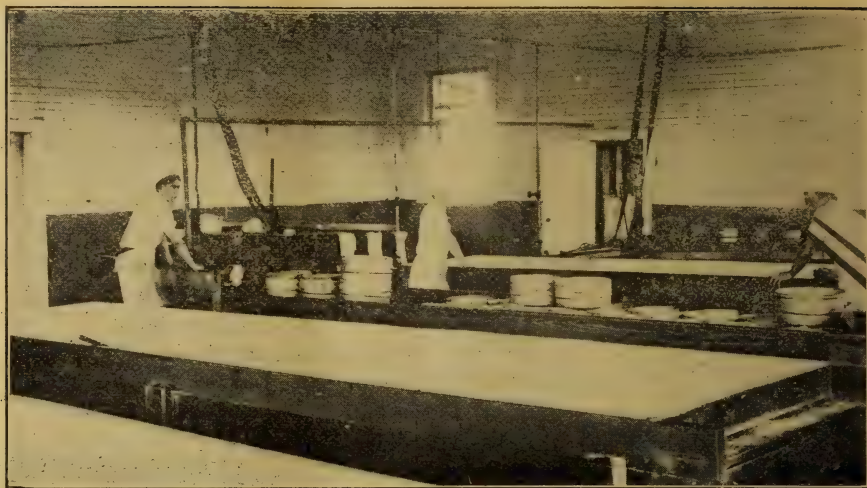
The Clover Leaf Cheese Factory, Tella Mook.

It was natural that with their limited shipping facilities the Tillamook dairymen should turn their milk from butter into cheese. It supplied them with a product which could be easily kept and handled, and with a means of condensing their milk in the ratio of 9 to 1. Tillamook cheese has been on the market since 1893. So well known has the product become that the western customer has been taught to call for "Tillamook" cheese, instead of "Cheddar," "American," "Cream," or "store cheese" as it is known to the average consumer.

The county since 1893 has specialized on cheese; there are no other dairy products manufactured. There are twenty-four factories in all, each operated co-operatively. An association operating a factory is usually composed of from twelve to thirty farmer stockholders.

tory organizations compose the Tillamook County Creamery Association. This body acts as a "supreme council" in governing the policies of the federated factories. It has general charge of such work as the buying of supplies, levying assessments, and conducting of advertising campaigns.

In direct charge of buying and selling is a Secretary-Salesman. The present incumbent has served in this capacity since the beginning of this Tillamook industry and to him no small parts of its success has been due. Working with the secretary is an inspector, who visits each factory weekly, passes on each day's make from each vat, and stamps with the association trademark enough boxes only for the first grade product. First grade stuff is rolled over a long stamp so that the word "Tillamook" is stamped on



A good example of successful co-operation.

every cut. Second grade cheese is sold in a plain package.

Oregon ranks first of the Western states in amount of cheese manufactured yet over half her product is made in Tillamook County alone. The county make last year amounted to 5,100,000 pounds, which yielded gross returns to the farmers of \$1,352,694. A cow census of the county last year showed over 12,000 dairy animals, with many pure bred herds of Jerseys, Guernseys and Holsteins—each mentioned breed maintaining a county

breed association. That the county is both progressive and thrifty is evidenced by the facts that their farms sell for \$300 to \$600 per acre; that, besides the above mentioned organizations, they maintain two cow test associations; the Tillamook Cheese Makers' Association; a county agriculturist; prospective boys' and girls' club leader; and a county dairy herd inspector. The county furnishes an excellent example of splendid co-operation.

Five Acre Corn Contest in Indiana

By R. S. Thomas.

Assistant in Soils and Crops Extension.

THE Five Acre Corn Contest which has been carried on for the past several years by the Indiana Corn Growers' Association in cooperation with the Purdue Extension Department is doing a great deal toward stimulating interest in more and better corn in Indiana.

The farmers of Indiana have always appreciated the value of the Five Acre work from the standpoint of stimulating interest in more and better corn and each year has been more successful than the preceding. While the idea of a contest does not appeal to every corn grower yet there are those who do their best work in an effort to excel. The work in fact seems to be growing in popularity.

Early in the spring a drive was begun for organization of the contest work and continued for four weeks. The services of five extra men were secured for this work and a strenuous effort put forth to increase the enrollment of the Indiana Corn Growers' Association and Five Acre Corn Contest, as well as to explain the benefits to be derived from the work. This organization work was done in some seventy counties in the state, spending one or more days in each county speaking at public meetings, talking to committees, and personal work over the county. As a result of this by June 15, at which time entry to the contest closed, 1,100 men were enrolled in the Five Acre

Corn Contest in fifty-eight counties in the state, making an approximate average of eighteen in each county.

The corn was planted in due time in most sections of the state and started off very good. Unfavorable weather conditions, however, severely handicapped the work during the growing season and naturally lowered the enrollment.

Throughout the month of August and first part of September, in fact just about the time the corn was beginning to mature, severe droughts extended over certain sections of the state and decidedly dwarfed the corn yields and so discouraged the contestants that they refused to finish the work. Many of the Five Acre demonstrations were either greatly damaged or completely destroyed on the river bottom areas due to the excessive amount of rainfall during the latter part of October and first part of November. Thus the enrollment was lowered a great deal by uncontrollable weather conditions.

On October 20 thirteen extra men were employed to estimate the yields of the Five Acre plots. A conference was held on the 20th at which time the details of the judging work were discussed and a definite schedule assigned to each man. This work continued for approximately four weeks, an extra amount of time being necessary due to the fact that the weather was very bad and that each man was doing some judging for the Boys' Corn Club Work.

Notwithstanding these different hindrances, this year has been the most successful the work has ever known from the standpoint of interest, enrollment, and results obtained by the work. Four hundred and fifty-one contestants in fifty-five counties in the state have successfully completed the work. One hundred and fifteen have raised 75-85 bushels of corn per acre on five acres and each has received a bronze medal, 102 have produced over 85 and under 100 bushels and have received a silver medal, while 24 have been successful in reaching or surpassing the 100 bushel mark and have received a gold medal. It is very unfortunate that some few of the contestants who have yields high enough to deserve a medal were not members of the Indiana Corn Growers' Association by June 15, and therefore did not receive state recognition. Thus, a

total of 241 medals or fifty-one per cent of the contestants have produced over 75 bushels of corn per acre on five acres. The average yield per acre among the contestants is 76 bushels per acre, while the average among the 241 medal men is 85 bushels. The estimated average production for the state is 37 bushels per acre. Mr. W. H. Baker of Greene County, holds the record this year for the highest yield, producing 118 bushels per acre on five acres. Mr. Fred W. Harting of Dearborn County, holds a close second, having raised 115 bushels per acre. The highest yield in 1918 was made by Mr. Everett McClure of Dearborn County, producing 108 bushels per acre on five acres. Union County leads in the total number of medals from any one county, having 7 bronze, 5 silver and 2 gold—a total of 14 medals. Greene County leads in total number of gold medals, having 5 men in the contest producing over 100 bushels per acre.

The cost accounts, although more nearly representing the actual cost of production than for any year previous, are still too low. It is hoped we may obtain a more accurate figure next year. However, the same principal which has been proven during previous years holds true in that the greater yield the lower the cost of production.

A monthly letter was sent from the secretary-treasurer's office to the members of the association, beginning in January. This included timely subjects relating to soils and crops work as well as information regarding the carrying through of the Five Acre Corn Contest. These have had a tendency to hold the association closer together, especially the Five Acre contestants and it is hoped that it may be continued another year.

The Five Acre work was placed more on a demonstrational basis this past year than in previous years. Different plots demonstrated certain principals relating to corn improvement, depending somewhat upon the locality and individual. Different methods of fertilization and kinds of fertilizers were used and results taken. Better methods of cultivation, relation of thickness of planting to yield, relation of barren stalks to yield and the breeding of corn are some of the principles brought out by these demonstra-

(Continued on page 270)

THE PURDUE AGRICULTURIST

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G. F. EKSTROM, Managing Editor

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ASSISTANTS

To the Editor:

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E. R. KUCK

J. J. INSKEEP

To the Business Manager:

B. E. HORRALL

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

LOOKING TO THE FUTURE

When we find the opportunity to forget for a moment the pell-mell and bustle of the present and can look toward the future it seems very difficult to predict what may be in store for our University. Purdue, like all other similar institutions is only well under way toward recovery from the abnormal period of the great war. This year her every facility is taxed to the limit to care for the great numbers of new students who desire a college education.

At best Purdue has never had a path of roses as far as finances are concerned. For years the University has been in very limited circumstances and all that has been accomplished has been against tremendous odds. This fact becomes very evident when we know that the great state of Indiana stands forty-third among the forty-eight states in the amount which it gives for higher education in proportion to its wealth. It is still more strongly impressed when we remember that Indiana has two state universities which must share whatever appropriations there may be.

The Universities must grow. The desire for education which is following in the wake of the great war makes certain an ever increasing number of students. What is Purdue going to do with the students that apply for entrance? Will she be forced to overtax her now limited

facilities and take care of them in the best way that she can? Will she turn them away and be responsible for their attending Universities in other states? Will Purdue be forced to stand still while other Universities grow and prosper?

The answer lies with the people of Indiana. It is high time that the people of our state realize this fact. A greater per cent of our high school boys and girls will expect to attend college each succeeding year. With the great advances that are being made in Agriculture and the increasing demand for technically trained men it is only natural and logical that more young people of Indiana will turn to Purdue each fall. They have a perfect right to demand an education in their own state University. Let the people of Indiana see that their state ranks among the first in its appropriations for higher education and Purdue will be able to hold the high position which it now occupies and render the service to the people which they will have the right to expect.

PURDUE APPLE SHOW.

The Purdue Apple Show held during Farmers' Week, January 12-16 will go down in history as the best apple show ever held at Purdue.

This year there were over two hundred entries, a forty per cent increase over last year. Also six hundred dollars worth of premiums were given the prize winners.

Many special exhibits added to the attractiveness of the show. Among these was an exact replica of the mechanical tower of the University built entirely of Gano apples from Oregon. Many commercial concerns from Indiana and neighboring states had special exhibits at the show and gave demonstrations of their goods.

The quality of the fruit shown was a revelation to supporters of the show. In all the entries only two plates were not judged. The sweepstakes plate of Wine-saps entered by C. G. Randell and W. S. Oberlin made the highest scores of any plate of apples ever shown at a Purdue show. Another feature of the show was two plates of Staymans entered by the same men, which scored 98 and 98 $\frac{3}{4}$ and won a twenty-five dollar cash prize. It is a notable fact that nearly all the prize winning fruit was grown in Indiana.

A special feature of the show was a student apple judging contest open to Horticultural specialists. The contest was won by O. R. Hensler '21.

The official judges of the show were H. H. Swaim, Secretary of the Indiana Horticultural society; F. P. Cullinan, of the Experiment Station, and F. C. Roth, of the Horticultural Department.

The attendance was good. In the four days over 1,500 people visited the show.

"CERTIFICATION OF SEED GRAIN."

We have all heard of the big things which the Indiana Corn Growers' association has done. Now comes the news that at their annual meeting which was held in January they appointed a committee to have charge of the certification of seed grain in Indiana for the coming year. This undoubtedly, after it is once started, will rank in importance to any and all of the other big things which they have put across. It is absolutely necessary that every farmer should heartily co-operate with the association in this, as well as in all of its other enterprises. By doing some real constructive work along the small grain line, it is hoped that it will encourage as large a SMALL GRAIN show both in counties, state and national shows as we have corn. This work is to start this summer. Indiana can not be first in the certification of small grains,

because Michigan, Wisconsin, Ohio and Illinois, states all around us, have already made good progress in this line, but we can show these neighboring states that Indiana will offer keen competition in this line and the sooner the farmers and grain dealers of the state take this matter up and push it, just that much sooner will that competition start. The work will be organized on a county basis, either the county agent or a local leader in charge of it. If at any time you wish additional information see your county agent, local leader or write to Mr. W. A. Ostrander, chairman of the committee at the Purdue Extension Dept., West Lafayette, Ind.

. TRACTOR SHORT COURSE

With the increased number of tractors used throughout the state comes the increased demand of wanting to know more about them. If you are interested here is your chance. There will be three tractor short courses given at Purdue on different dates so as to enable those interested to pick out the time best suited to them and also accommodate a larger number of students. The purpose of the course is to give an opportunity to those interested in the better operation of tractors and other power units. The outline of the course is as follows:

Principles of gas engine operation.

Mechanical details of tractors.

Adjustment of bearings, valve grinding and cleaning out carbon.

Magnetos, and ignition system.

Carburators and fuel systems.

Lubrication and oiling systems.

Clutches, starting and operating tractors.

Trouble hunting.

Field operations and plow adjustments.

Brake and draw-bar testing.

Equipment will include twelve of the latest models of tractors used in Indiana, besides stationary engines, magnetos, coils, carburators, etc. The only expense to the student will be a matriculation fee of \$2.00 and his room and board while here. If you are interested write to the Farm Mechanic Department, Purdue University and tell them which course you will attend. This is absolutely necessary for the accommodation of all applicants.

General Farm Records

By Lynn Robertson,
State Leader Farm Management Demonstrations.

(This is the first of three articles by Mr. Robertson on Farm Accounting which will be published monthly in the Agriculturist.)

DOES it pay to keep farm records? A rapidly increasing per cent of farmers would answer in the affirmative. In fact, nearly every farmer keeps some kind of a record of at least a part of his farm business. He may have a complicated double entry system which shows the details for every crop and livestock enterprise or it may range all the way from this down to a few figures scratched on the granary wall at threshing time.

The kinds of records that are commonly kept may be divided into two groups, general financial records and cost accounts, with many variations of each. The general financial records, if complete enough, show the profits from the farm as a whole, but do not show from what part of the business the profits were made. This information is given by cost accounts.

The type of record that any farmer may keep to best advantage depends to a large extent on the use he will make of the figures he puts down. The man who is interested in his records from the point of view of studying his farm business and who will summarize his figures and interpret them with this in mind is justified in keeping much more complete accounts than the man who merely wants to secure figures to enter in the income tax blank and who will not use his results farther than this.

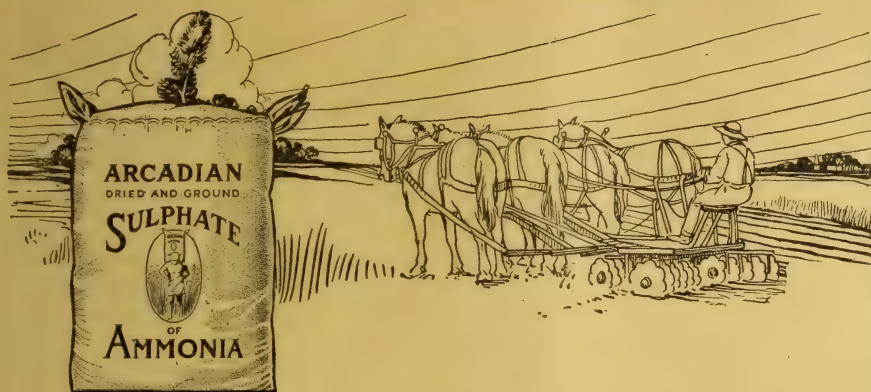
The tendency of most people is to start too complicated a system of accounts rather than to begin with simple records and develop them. A few simple records kept with a definite object in mind and summarized and studied are of much greater value to a farmer than a great mass of figures set down but not summarized and made use of. The more complete the records are, the greater is their possibility of usefulness. However, it requires more time and patience for the more complete accounts. A farm-

er must usually be his own bookkeeper and in most cases after he comes into the house from a day's work, he does not feel like writing very much in a book. Therefore, the kind of records that are kept should be the simplest that will give the results desired.

A system of accounts that will show the cost of production of crops and livestock is in increasing demand. Such a system requires that a record be kept not only of all the cash transactions but also of the work done on each crop and amount of livestock and the feed fed to each class of stock. A great deal of work is required in distributing charges such as shelter, machinery expense and overhead to the various livestock and crop enterprises. To some farmers a system of records less complete than this is unsatisfactory but for most people it is much better not to start these complete cost accounts until they have had experience with the more simple records.

For the general farmer the most profitable form of record that can be kept, taking into consideration the time required as well as the results secured, is one of cash receipts and expenses and an annual inventory of land, machinery, livestock, feed and supplies. The information secured from such records is all that is needed for determining the profits from the year's business. If the cash operating expenses for the year and a reasonable depreciation on buildings, fences and machinery be subtracted from the cash receipts, and the difference in inventory of livestock, feed and supplies be added or subtracted, depending upon whether it is an increase or a decrease, the result gives the net income from the farm business for the year. From such a summary many figures are available that will help in studying the business with a view to making it more profitable.

(Continued on page 270)



TOP DRESSING TALKS, No. 4

Theory of Top-Dressing

Top-dressing refers to the application of a fertilizer to growing crops and includes "side application," "intercultural application" and "late application."

This practice of top-dressing growing crops with a quickly available nitrogenous fertilizer is one of the comparatively recent advances in the scientific use of plant food.

Potash and phosphoric acid become insoluble when added to the soil and must be applied before planting the crop in order that they may be mixed throughout the feeding area. If all of the nitrogen necessary for growth were to be added at this time, large amounts would be leached away before the plant could use it. By reinforcing the complete fertilizer by top-dressing the growing plant at just the right time, more nitrogen can be used profitably and better use may be made of the potash and phosphoric acid applied in the complete fertilizer.

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Sulphate of Ammonia

Arcadian has been prepared to meet the growing demands for a high grade nitrogenous top-dressing of good mechanical condition. Its non-leaching property assures highest yields.

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AGRICULTURAL DEPARTMENT, NEW YORK

Growing Sugar Beets in Indiana

By W. E. Leer, '19,
Assistant in Crops.

SINCE the Holland-St. Louis Sugar Company established a beet sugar factory at Decatur, Ind., the sugar beet industry in Indiana has been steadily increasing and is now becoming an important and a permanent part of our agriculture. The greater part of Indiana lends itself to general farming practices, which are conducive to best results in sugar beet production. At the present time sugar beets are being produced mostly by those farmers who are devoting themselves to the production of more or less diversified crops. The attitude of the farmer towards sugar beet production depends almost wholly upon the profit derived from the labor expended and from the money invested in producing the crops.

The land must be suitable for sugar beet production. Land which is undesirable for growing other crops is equally as undesirable for growing sugar beets. No crop responds more quickly to a good soil, proper soil preparation and careful attention than sugar beets.

Generally speaking, the weather conditions in Indiana are suitable for sugar beet production, and when other crops commonly grown in Indiana respond to the weather conditions, sugar beets will respond equally well to the same conditions and often times they will fare better because they are not affected by early and late frosts and they are not so susceptible to the variations in moisture.

Soil Requirements.

In a general way any soil which is adapted to corn and wheat growing is adaptable to sugar beet growing. A clay or sandy loam soil with a sufficient supply of organic matter is one of the best sugar beet soils. The best soils are those containing an abundance of plant food and a goodly supply of organic matter. This should be deep, well drained, easily tillable and have a firm but not hard subsoil. The subsoil is very important. If it is too hard the beet will not penetrate it readily and as a result will be pushed out of the ground during growth. It should not be impervious, as this pre-

vents proper drainage; and on the other hand, it should not be too loose as this will allow the water to pass through too freely. While the sugar beet is capable of withstanding extremes of moisture better than most farm crops, it is entirely possible for its growth to be checked by either too much or too little water. Stony or gravelly soils and light sandy soils should be avoided for sugar beet growing.

Farm Practices in Growing Sugar Beets.

Although sugar beets will fit in with most any corn belt rotations, it is usually best to have them follow either corn or clover sod in the rotation and preferably the latter. It is usually advisable to follow sugar beets with one of the small grain crops, as they invariably do well after sugar beets. The sugar beet is a clean culture crop and prepares the soil for small grain crops.

Sugar beet growers appreciate the value of farm manure in keeping up the fertility of the soil and adding organic matter which will maintain a good physical condition of the soil. No crop responds more successfully to an abundance of plant food than sugar beets. Manure should be applied at the rate of from 10 to 12 tons per acre. If the sugar beets are to follow corn, it is advisable to apply the manure to the land before plowing for corn, and if they follow clover sod the manure should be applied to the clover sod before plowing for the beets.

Commercial fertilizers have generally proven good investments for sugar beet growers. A complete fertilizer which is readily available should be used. Too much nitrogen will cause the beets to "go to tops" and fail to store sugar properly. Potash and phosphoric acid are essential for the proper storage of sugar and for the development of the beet. About 150 pounds of commercial fertilizer containing 2 per cent nitrogen, 8 per cent phosphoric acid, and 4 per cent potash, per acre is considered a good recommendation for sugar beets. The

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*The Fordson Tractor and the Stover No. 40 Feed
Mill make a fine combination*

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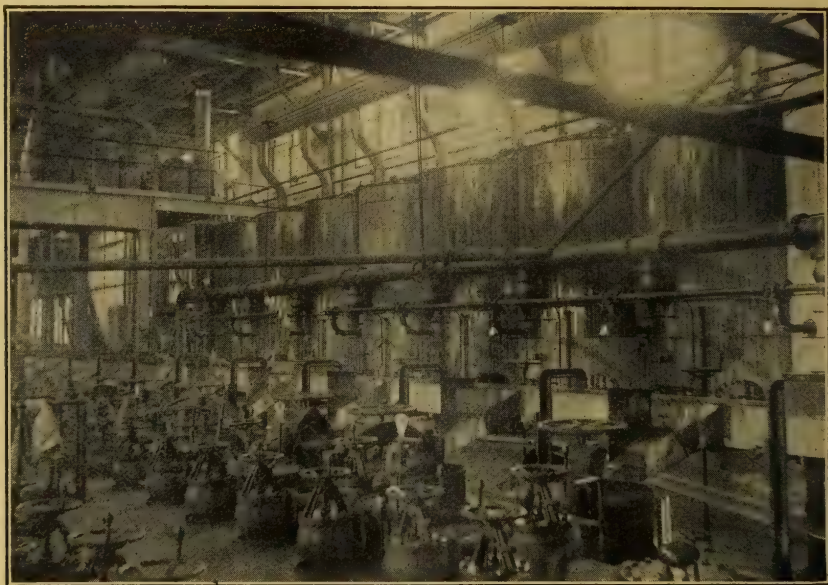
FORDSON CALENDAR.

January Corn shelling, feed grinding, straw baling, wood sawing.	February Corn shelling, baling, feed grinding, wood sawing.	March Plowing, discing, rolling wheat, dragging roads, stump pulling.	April Plowing, discing, cultipacking, drilling, road building, manure spreading.
May Plowing, discing, cultipacking, harrowing corn.	June. Harvesting, hay loading and hauling, baling.	July Harvesting, threshing and hauling, hay baling.	August Clover hulling, threshing, plowing, discing, cultipacking corn.
September Drilling, cultipacking, silo filling, huling clover.	October Plowing, seeding, baling, clover hulling.	November Corn shredding, fall breaking, feed grinding.	December Corn shelling, feed grinding, corn shredding, straw baling.

fertilizer may be drilled in at the same time the seeding is done, using a fertilizer attachment for the drill, or it may be broadcasted before or after seeding. The former is considered the best practice.

Sugar beets require a well prepared, deep, firm seed bed. To obtain this the land must be in good condition at the time of plowing and must be plowed deep enough to allow the long tap root of the sugar beet to penetrate some distance

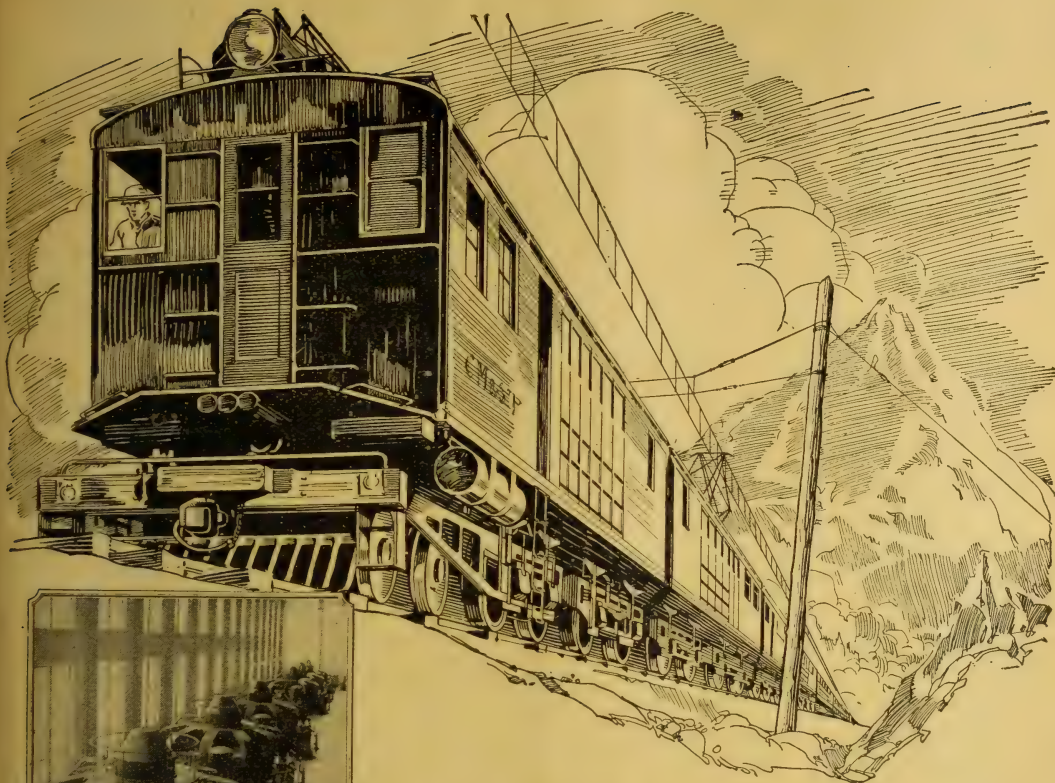
Planting may be done any time after the weather has warmed up sufficiently to insure proper and prompt germination of the seed. There should be a fairly good supply of moisture at seeding time to insure and even germination. Usually from April 1 to June 1 is considered the planting season, depending upon weather conditions. However, beets may be planted as late as July 1, and yet get a fair yield of beets if weather conditions are favorable. Where large



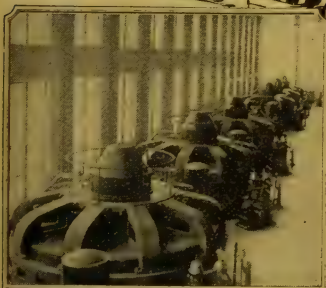
Interior view of Indiana's sugar beet factory at Decatur, Ind. Over 13,000,000 pounds of sugar were manufactured for Indiana consumers last year.

into the soil. The soil should be plowed in the fall if possible and usually from 6 to 9 inches deep. The more carefully the soil is prepared and the freer it is from grass and weeds the less will be the labor and expense required in caring for the crops. Discing, harrowing and dragging are usually necessary operations in order to have the seed bed in the very best condition. A well prepared seed bed is a sugar beet crop half grown. It is always the best policy, and the only one to recommend, to prepare the seed bed thoroughly before seeding, rather than seeding in a poorly prepared seed bed, then trying to get the seed bed in condition all during the growing season. Weeds are always less troublesome in a well prepared seed bed than in a poorly prepared one.

areas are to be planted to beets, it is best to plant in small plots at intervals of from 5 to 7 days in order that the beets will not all be ready to block at one time. A good stand of beets is the first requisite for a profitable beet crop, hence plenty of seed should be used. The beet sugar company who handles the contract furnishes the seed at a fair price to the grower. Seed is worth about 15 cents per pound, and about 15 pounds of seed should be planted per acre. The seed should be drilled continuous in solid rows and later blocked and thinned to insure the best stand of beets. The rows should be 20 inches apart. Best results have been obtained by using special beet drills for planting. The seed should be covered to a depth from about one-fourth to one-half inch only.



The Power of Electricity in Transportation



Generator room of one of the hydro-electric plants which supply power to the C. M. & St. P.

Some Advantages of Railroad Electrification

- Saving the Nation's coal.
- Lower maintenance costs.
- Greater reliability and fewer delays.
- Ability to haul smoothly heavier trains at higher speed.
- Operation of electric locomotives unaffected by extreme cold.
- Ability to brake trains on descending grades by returning power to the trolley

ELECTRICITY has leveled out the Continental Divide. The steam locomotive, marvelous as it is after a century of development, cannot meet all of the present demands for transportation facilities. Its electric rival has proved to be far superior.

On the mountain divisions of the Chicago, Milwaukee & St. Paul Railway—the world's greatest electrification—giant electric locomotives today lift an ever increasing freight tonnage over the mile-high Rockies and also make traveling clean and comfortable. They utilize the abundant energy of distant waterfalls and then, by returning some of this power to the trolley, safely brake the trains on descending grades. And their capabilities are not impaired by excessively cold weather when the steam engine is frozen and helpless.

Electricity is the power which drives the trains of New York City's subway and elevated systems. It operates the locks and tows the ships through the Panama Canal. It propels the Navy's latest super-dreadnaught, the *New Mexico*. Electric mine locomotives have replaced the slow-moving mule and the electric automobile has also come to do an important service. Such achievements were made possible by the extensive research and manufacturing activities of the General Electric Company.

Electricity has become the universal motive power. It has contributed efficiency and comfort to every form of transportation service and in this evolution General Electric apparatus has played a large part—from mighty electric locomotives to the tiny lamp for the automobile.

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As soon as the beets are up enough so that the rows can be seen plainly, they should be cultivated. It is always easier to kill weeds while they are young than after they have been allowed to get a start. Blocking and thinning should follow closely the first cultivation. Any delay in these operations will cause a decided decrease in yield of beets. They should be blocked and thinned so that there is one beet at regular intervals of from 9 to 12 inches in the row. These operations are usually done by contract laborers who have had previous experience in the work and who are furnished by the beet sugar company to the grower at a reasonable contract price and who are under the supervision of the company's field man in charge of that particular territory. Quite often the grower wishes to perform this work with his own labor. This is usually satisfactory if the grower has sufficient labor to perform the work at the proper time. After the beets have been blocked and thinned they should

have frequent cultivations all during the growing season. There should be at least five cultivations during the growing season, and as many more as is necessary to keep the field in good condition. Of course the number of cultivations necessary will depend upon the weather conditions and upon the thoroughness of the first few cultivations. In order to keep the rows free from weeds, hoeing is usually necessary, and two hoeings will usually keep most of the weeds out of the rows. This operation is also usually done by contract labor, but may be done by the grower. The special beet cultivators should be used for the cultivating as they are equipped with the proper accessories for cultivating sugar beets. A roller, or a culti-packer should be used while the beets are young to keep the soil firm and to keep the beets growing in the ground rather than above the ground. The use of these implements will depend upon the condition of the soil and should be used with judgment.

Home Curing of Meats--Pork

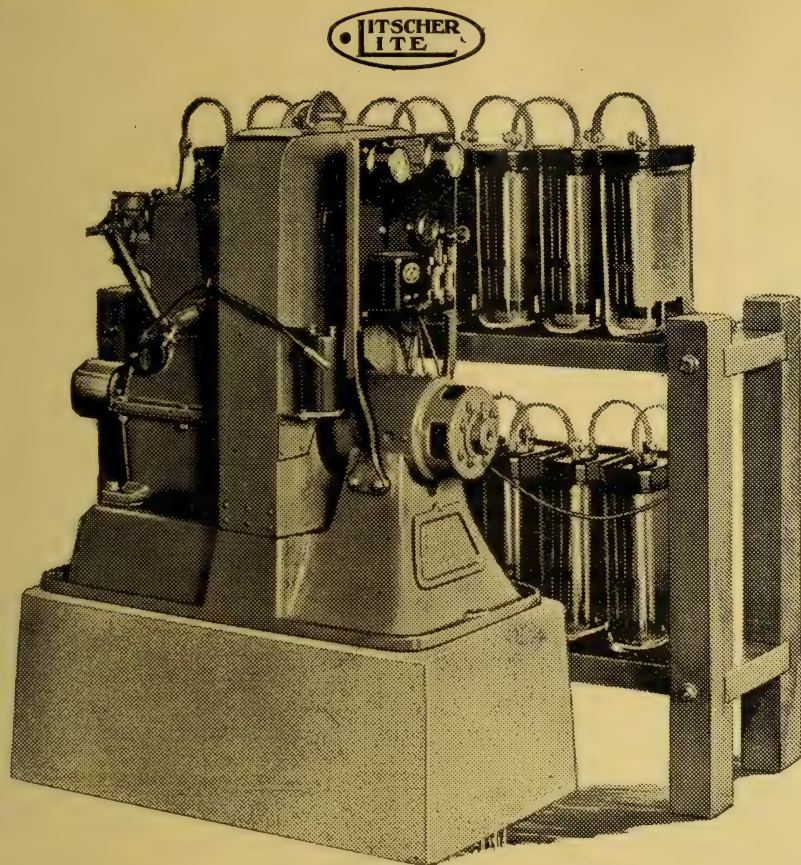
General Methods

DRYING.—This is not only the oldest method of preserving foods, but it is the simplest. While drying is better adapted to the curing of fruits and vegetables than it is to meats, yet meats are often shredded and dried in many parts of the world. Drying meats should only be practiced where there is little moisture in the atmosphere, or the meat will spoil before it becomes dry enough. It is never advisable to attempt to preserve meats by this method in cities where there is great danger of bacteria. Dried meat maintains all of its nutritive properties, but it is not easily digested on account of the toughened tissues. This product is not attractive in appearance, and this fact also works against its extensive use.

Smoking.—The custom of smoking meats is said to have originated from the habit of suspending meat near the fireplace in the dwelling. The meat became saturated with the creosote from the

smoke, which gave it an agreeable taste and aided in its keeping qualities. The creosote was formed by the burning of the wood, and the smoke closed the pores to some extent, excluding the air and proving objectionable to insects. Before meats are smoked they usually undergo a treatment of salt and sugar, with sometimes a small amount of saltpetre added to modify the color, composition and flavor, and to aid in the preservation of the meat. Saltpetre is considered injurious to health by some hygienists, and therefore many may object to its use. It is included in some of these receipts because its use had heretofore been customary.

Because the old method of smoking meats is long and expensive, a cheaper and quicker way has come into practice rather recently. Directions for this latter method state that brine is soaked into the meat, which is then treated with "smoke" or "liquid smoke." This solution



The **Litscher Lite** Plant is started by a push of a button, and runs on kerosene. One gallon of kerosene will run a **Litscher Lite** Plant for several hours.

The **Litscher Lite** Plant has two full H. P. in excess of its dynamo requirements. When the dynamo is idle, four H. P. are at your command for running any belt driven farm machinery. In other words the **Litscher Lite** Plant is an electric lighting plant and a stationary power plant combined.

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Liquid Smoke Method.—200 pounds of meat, 4 quarts of coarse salt, 1 pound of brown sugar, 1 ounce of saltpetre, 1 quart of warm water and $\frac{1}{4}$ pound of ground pepper.

Dissolve the salepêtre in the water, add salt and sugar, and mix well. Rub this mixture into the meat, and lay on a bench in a cold place for fourteen days. Then apply the liquid smoke with a brush, dry well, and in a few days paint the meat again with the liquid. Hang up, and when thoroughly dry wrap the meat in heavy brown paper and then in a clean flour sack.

Much time is saved by using the above recipe, but the meat which has been cured in the old fashioned smoke-house is much finer in flavor and texture. Smoke-houses are still in use in many sections of the country. The meat should not be subjected to the smoke until it has been properly cured and drained.

Curing in Brine and Dry Salting.—Curing should begin as soon as the meat is cold and while it is still fresh. Frozen meats should not be salted, as the action of the frost will prevent proper penetration of the salt and uneven curing will result.

Pure water, salt, sugar and saltpetre are all the ingredients needed for ordinary curing of meat. Meat may be packed in large earthen jars or in clean barrels, tight enough to prevent leakage. The barrel or jar may be used again and again unless meat has spoiled in it. These vessels should always be scalded thoroughly each time before packing fresh meat into them.

Brine-cured meats are best for farm use, for the reason that a suitable place for dry-curing is not usually obtainable. It is also less trouble to pack the meat in a barrel and pour on a brine than to go over it three or four times to rub in the salt. The brining method also gives better protection from insects and vermin. Trouble is sometimes experienced in keeping brine, but if pure water is used and directions are followed in making the brine there should be no difficulty in keeping it for a reasonable length of time. During warm weather brine should be closely watched. If it becomes "ropy"

it should be boiled or more brine made. A cool, moist cellar is the best place for brine-curing. Dry-curing may be done successfully in a cellar also, though even more moisture is needed to effect a thorough cure. The cellar should be dark and tight enough to prevent flies and vermin from damaging the meat. When meats which have been cured in brine are boiled the shrinkage is greater than those which have been cured by dry-salting.

Preserving Pork.

Plain Salt Pork.—Rub each piece of meat with fine common salt and pack closely in a barrel. Let stand over night. The next day weight out ten pounds of salt and two ounces of saltpetre to each 100 pounds of meat and dissolve in four gallons of boiling water. Pour this brine over the meat when cold, cover, and weigh down to keep it under the brine.

How to Cure, Smoke, and Keep Hams, Shoulders and Bacon.—Meat cannot be safely cured if it has any animal heat in it.

Salting.—No sugar and no saltpetre are used in this recipe. A hanging pew, box, or cask may be used for packing salted pork. First, place a layer of salt and pepper on the bottom of the pew or box, then the pieces of meat, skin down, salting the top heavily; then another layer, skin down, salting it, and so on, covering every particle of the meat, sides, ends and top with salt. When done the meat will look like a pile of salt. Hams, shoulders and bacon are salted in this manner and allowed to stand three or four weeks, according to the weather. If it is very cold it takes a longer period. If the weather turns warm, shorten the period, but endeavor to cure the meat in a room that will average a temperature of 50 degrees, if possible. If during curing the salt becomes crusted, overhaul the meat, rub the salt in thoroughly by hand, and pack it back in the same salt. When the meat has remained in the salt for the proper time, remove it, wash the meat thoroughly with tepid water, scrubbing it with a brush until all salt is removed from the outside, then hang "as the hog walks"—shanks down.

Pickled Hams and Bacon in Brine.—This recipe differs from the one given,



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WHEN asked what feature in the Perfection Milker he considered most valuable Mr. Charles M. Yarter, who is a well known dairyman in his State, said recently: "With the use of the Perfection we milk and strip fifty-four cows in eighty minutes, and yet I consider the greatest profit derived from using the Perfection is not so much in the time it saves as in the increased milk flow. We surely get much more milk with the machine than we could if we depended on hired help to do all the milking by hand, and we are getting a much better quality of milk too."

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"I have gotten more benefit for each dollar put into my Perfection than from any other machine on my farm. We use the machine twice daily, Summer and Winter, while we only use any of our other machines a few weeks during the year. *The milker helps to make all our other machinery more valuable by giving us longer days to use it.*

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in that it calls for saltpetre and water. It has given satisfaction and is preferred by some. When the meat is cold, rub each piece with salt and allow it to drain over night. Then pack it in a barrel with the hams and shoulders in the bottom, using the strips of bacon to fill in between or to put on top. Weigh out for each 100 pounds of meat eight pounds of salt, two pounds of brown sugar, and two ounces of saltpetre. Dissolve all in four gallons of water, and cover the meat with the brine. For summer use it will be safest to boil the brine before using. In that case it should be thoroughly cooled before it is used. For winter curing it is not necessary to boil the brine. Bacon strips should remain in this brine four to six weeks; hams, six to eight weeks. Hams and bacon cured in the spring will keep right through the summer after they are smoked. The meat will be sweet and palatable if it is properly smoked, and the flavor will be good.

Head Cheese—Cut a hog's head into four pieces. Remove the brain, ears, skin, snout and eyes. Cut off the fattest parts for lard. Put the lean and bony parts to soak overnight in cold water in order to extract the blood and dirt. When the meat is cleaned, put it over the fire to boil, using water enough to cover it. Boil until the meat separates readily from the bones. Drain off the liquor, saving a part of it for future use. Chop the meat up finely with a chopping knife. Return it to the kettle and pour on enough of the liquor to cover the meat. Let it boil slowly for fifteen minutes to half hour. Season to taste with salt and pepper just before removing it from the fire. Turn into a shallow pan or dish. Cover with a piece of cheese cloth and put on a board with a weight to make it solid. When cold it should be sliced thinly and served without further cooking.

Scrapple.—The process for making this article of food is like that for head cheese until the bones are removed and the meat chopped. When the liquor is added, return the pan to the stove and boil. Corn meal is then stirred in until the contents are as thick as corn meal mush. Stir it constantly for the first fifteen minutes. Then set it back on the stove to boil slow for an hour. When it is done, pour it in-

to a shallow dish to mould. Hot grease poured over the top after scrapple is put into moulds will help in keeping it. When cold it is sliced in thin pieces and fried.

Pickled Pigs' Feet.—Pigs' feet should be thoroughly scalded, cleaned, washed and chilled, and cured in a clean, sterilized wooden vessel. Strength of pickle depends upon length of time it is to be carried, say an 80 degree pickle, with five ounces of saltpetre per 100 pounds of meat for shipment in ten days, a 100 degree pickle for five days. Some curers use in addition one and one-half pounds of sugar per 100 pounds of feet. Pigs' feet cured by this method will be white and more attractive than when pickled with spices.

If spices are used it must be remembered that cloves tend to darken the feet. Curing should be effected in a clean wooden receptacle, using clean water for each batch.

Trying Out Lard.—Only the best of fat should be used for choice lard. Leaf fat is the best. Leaf lard is that which is made from the leaf fat which lies around the kidneys. The next best in quality is that from the back, and the poorest quality is that from around the intestines. The greater part of the lard marketed is obtained by melting together the whole fat except the leaf fat. The back strip of the side also makes nice lard, as do the ham, shoulder, and neck trimmings. Fat from around the intestines should never be mixed with the leaf and back fat. It makes a strong-smelling lard and should be kept before trying out, as they are very likely to stick to the kettle and get scorched, giving an unpleasant flavor to the lard. When preparing the fat for trying, cut it into pieces from one to one and one-half inches square. The pieces should be nearly equal in size so that they will try out in about the same time. Fill a clean kettle about three-fourths full, and put in a quart of water or, if convenient, a quart of hot lard. One or the other is necessary to prevent the fat from burning before the heat is sufficient to bring out the grease. Keep the kettle over a moderate fire until the cracklings are brown and light enough to float. Fre-

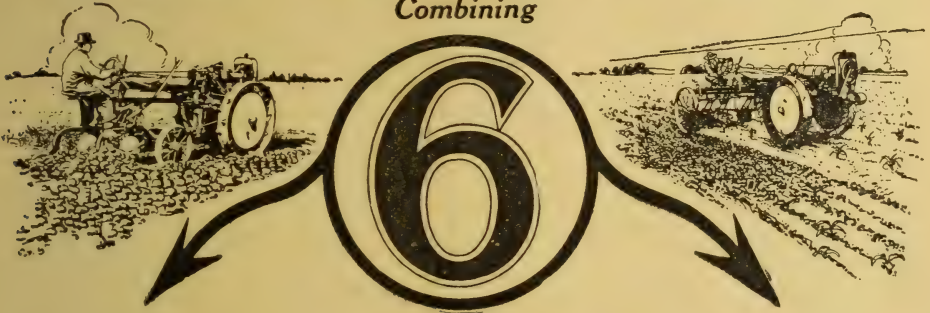
(Continued on page 280)

SIX TESTS FOR A FARM POWER-PLANT

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Selecting and Care of Eggs for Hatching

By F. C. Stevenson, '21

IN the selection of eggs for hatching the first and most important consideration is the selection of the parent stock. The parent stock should be of strong constitutional vigor, desirable breeders, and normal in every way. As a hen is usually at her best and lays the heaviest eggs during her first hen season, it is better to pick the parent stock from birds of this age.

The eggs which are held for hatching, from the selected desirable breeders, should be of uniform size, should weigh not less than two ounces per egg, should be of uniform color and shape, and be free from ridges and roughness. It is very important that the eggs set be the best possible in every characteristic, because the size of the chick will depend upon the size and weight of the egg, and any abnormality in the egg will very likely produce an individual, if a pullet, which will lay eggs possessing the same abnormality.

It is usually necessary to set about six eggs for each pullet brought to maturity, providing the vigor of the parent stock is good, and a greater number if the vigor of the parent stock is not so good.

The hatchability of the eggs and the vigor of the chicks is influenced very much by the care of the eggs before incubation. As soon as the egg is laid it cools, and on cooling to 68° F. the embryo ceases to grow and rests in a dormant state as long as the temperature stays below 68° F. Ideal conditions for the handling of the eggs would be for incubation to begin before the egg cools to 68° F., but as this is impracticable it is necessary to hold the eggs until a sufficient number of desirable eggs can be selected. The period for which the eggs are held should be as short as possible, and not exceed two weeks, as this is considered the limit which eggs can be held under conditions that will give the most satisfactory hatching results.

As incubation commences at any temperature above 68° F. the eggs for hatching should be kept in a temperature be-

low 68° F. If the temperature of the eggs gets too low, bad results will be obtained, due to the effects of chilling, so a temperature only a few degrees below 68° F. should be selected. Good results have been obtained by keeping the eggs in as even a temperature as possible and between 55° F. and 65° F. A cool and well ventilated cellar is a very good place for holding the eggs.

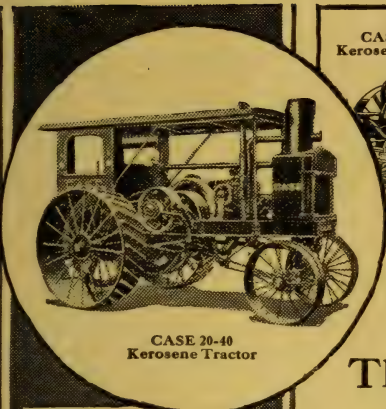
The eggs for hatching should be turned once a day for the entire time they are held. This turning is made necessary due to the fact that the yolk floats in the albumen with the germ spot uppermost, and if left laying in one position the yolk gradually rises until it comes in contact with the shell membrane and the germ is killed. If the egg is turned frequently the yolk does not have a chance to rise through the albumen on any one side and consequently remains normal.

The mistake is often made of washing hatching eggs merely to remove stains or dirt. This should be avoided, as washing destroys the cuticle of the egg and allows evaporation to take place more rapidly. If it is deemed desirable to disinfect purchased eggs, due to the prevalence of chick diseases which are carried by germs on the shells, the eggs may be dipped in 92 per cent. alcohol or in a two to three percent solution of a standard stock dip. The eggs should not be wiped after the dipping as this what destroys the damp cuticle. This dipping is unnecessary when it is certain that the eggs came from a good healthy flock.

Are you an Agriculturist? If not, why not now?

It is quite generally known that ether is superior to gasoline or benzine for cleaning textile fabrics.

If you are going to buy an incubator do not lose any time. Delays in receipt of goods are almost inevitable under present conditions. To be sure of having the machine when you need it, place your order at once.



CASE 20-40
Kerosene Tractor



CASE 22-40
Kerosene Tractor

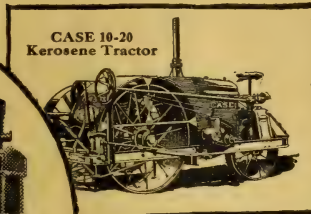


CASE 15-27
Kerosene Tractor



CASE 10-18
Kerosene Tractor

NOTE: We want the public to know that our plows and harrows are NOT the Case plows and harrows made by the J. I. Case Plow Works Co.



CASE 10-20
Kerosene Tractor



Look for the
EAGLE
Our Trade Mark

To avoid confusion, the J. I. CASE THRESHING MACHINE COMPANY desires to have it known that it is not now and never has been interested in, or in any way connected or affiliated with the J. I. Case Plow Works, or the Wallis Tractor Company, or the J. I. Case Plow Works Co.

The Case Line Offers Choice of Required Power and Capacity

KEROSENE TRACTORS

The Case 10-18 Tractor drives 20x28 Thresher with Windstacker, Feeder and Grain Handler; No. 12 Case Silo Filler with 40 ft. blower pipe; 17x22 Hay Baler; will pull 2-bottom plow, 6 to 8 inches deep, depending on soil and field conditions; 8 ft. double action Disc Harrow; 22 shoe Grain Drill; two 6 ft. Binders.

The Case 10-20 Tractor drives 22x36 Thresher and full equipment, pulls 3-bottom plow under favorable conditions; other machinery requiring similar power.

The Case 15-27 Tractor drives 26x46 Thresher with Feeder and Windstacker; three 14 in. plows in hard plowing, or four under favorable conditions; 10 ft. double-action Disc Harrow; two 7 ft. Binders, etc.

The Case 22-40 Tractor drives 32x54 Thresher with Windstacker, Feeder and Grain Handler; No. 20 Case Silo Filler with 40 ft. blower pipe; four 14 in. plows in hard ground or five under favorable conditions; battery of Grain Drills or Harrows.

The Case 20-40 Tractor will handle belt and drawbar jobs similar to 22-40.

The J. I. Case Threshing Machine Company also builds:

Double Disc Harrows for use with tractors
Grand Detour Plows, all sizes and for all soils and conditions

Threshing Machines,—six sizes
Hay Balers,—two sizes
Silo Fillers,—three sizes
Road Graders,—three sizes
Steam Tractors,—eight sizes
Rock Crushers,—two sizes
Steam Road Rollers,—two sizes

Booklets, describing and illustrating any products above mentioned, furnished on request.

J. I. CASE THRESHING MACHINE COMPANY, Inc.

Dept., CB-2 Racine, Wis., U. S. A.

Making Superior Farm Machinery Since 1842

THE OAKES ELECTRIC HEN



Incubator and Hover---two machines in one.
The most convenient and satisfactory hatching
device.

Every machine tested and guaranteed.

Send for booklet showing our complete line of
supplies for Poultrymen.

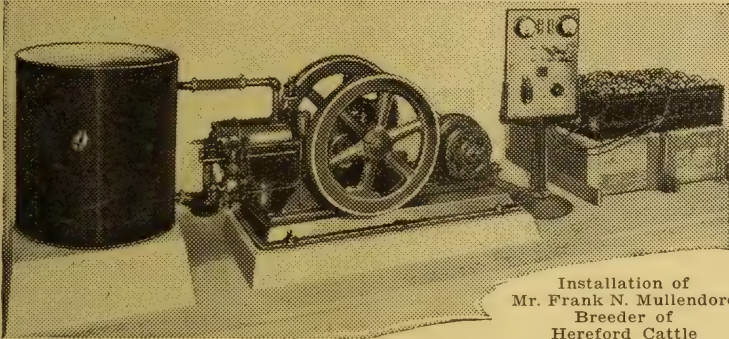
THE OAKES MFG. CO.

355 Dearborn Street

TIPTON, INDIANA

EASTERN OFFICE:

The L. R. Oakes Co., 238 W. 28th St., New York, N. Y.



Installation of
Mr. Frank N. Mullendore
Breeder of
Hereford Cattle
Franklin, Indiana

Investigate the Service that a SWARTZ LIGHT PLANT will give you

And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

A Word as to the Swartz Policy

From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

Send for Complete Information

There is a Swartz Electric Power and Light System of proper size and voltage to meet your individual requirements at minimum cost. Ask for your copy of the Swartz Catalogue.

Swartz Electric Company

Oldest Exclusive Makers.

General Offices and Works,
Speedway, Indianapolis

Indianapolis Branch,
5 N. Meridian St.

Alumni and Local

THE NEW HORSE BARN

The horse barn was completed in July, 1919, and is now in use. It is constructed of brick with a tile roof and concrete floors. The front part of the building is 94 feet long and 41 feet wide and two stories high. There are two wings extending back from either end of the front portion. These are 72 feet long and 41 feet wide, between which is a large well lighted judging building with tan bark floor. The building contains 28 single stalls, 12 double stalls, and will accommodate from 40 to 50 horses. The completeness of the building may be illustrated by the feed rooms, wash rooms and office.

DEAN BENJAMIN.

With the resignation of Dean Benjamin, not only the School of Engineering, but the University as a whole sees the passing of a man who has labored well in the interests of Purdue. Dean Benjamin came to Purdue in 1907, with a wealth of engineering knowledge gained through wide study and practical experience. His resignation is to take effect in 1921. Known every where as "a practical engineer, a keen thinker, and a man who has

loved his profession as an engineer" Dean Benjamin, since being here has done much to place Purdue near the top, in the long list of engineering schools and to acquaint men in the industrial world with our University.

R. R. Jamison, '19, and Miss Elizabeth Durnall, of Marshallton, Pa., were married December 18 at Westchester, Pa., by Rev. Chas. A. Walker. Mr. Jamison was a very active student in University activities while in the University, and is now associate editor of Sharples News.

NEW INSTRUCTOR ON ATHLETIC STAFF

Mr. M. L. Clevett comes to Purdue with an enviable record, having been a successful athletic director at Attoma, Iowa, South Park, Chicago, Culver Military Academy and Carlisle Indian School. During the war he was athletic director of the army Y. M. C. A. at Camp Crane, Allentown, Pa. He comes to Purdue from the Y. M. C. A. at Fairmount, W. Va. Clevett will give special attention to intermural sports, swimming, boxing, and gymnastic classes, which any student desiring to do so may enter.



The new beef cattle barn. A model of efficiency and sanitation. May it be the home of many future Merry Monarchs' and Fyvie Knights'.

Oliver

The Quality of Plowing

obtained in a minimum time with a minimum amount of labor by the use of Oliver tractor plows prevents spending unnecessary effort to accomplish desired plowing results.

Oliver Chilled Plow Works

Plowmakers for the World

Indianapolis, Ind.

South Bend, Ind.





"Wheels on a track - the Cletrac way - take less power"

WATCH THE CLETRAC

Make it a point to see a Cletrac in action somewhere.

Watch it turn the brown furrows—plowing faster—doing better work. Light-footed, but powerful, the Cletrac easily pulls a double disc and a seeder over the mellowed seed bed—never "digs in," never "wallows"—doesn't pack the soil.

Up hill and down, over wet, sticky ground or light, sandy soil, the small, compact, powerful Cletrac crawls sturdily on—riding on its own metal tracks.

Watch it in the hay field and the harvest field or running ditches, pulling stumps, sawing wood, filling silos—any *hard job* is a Cletrac job.

You'll want to know why progressive farmers are choosing the Cletrac.

Write for the booklet "Selecting a Tractor"

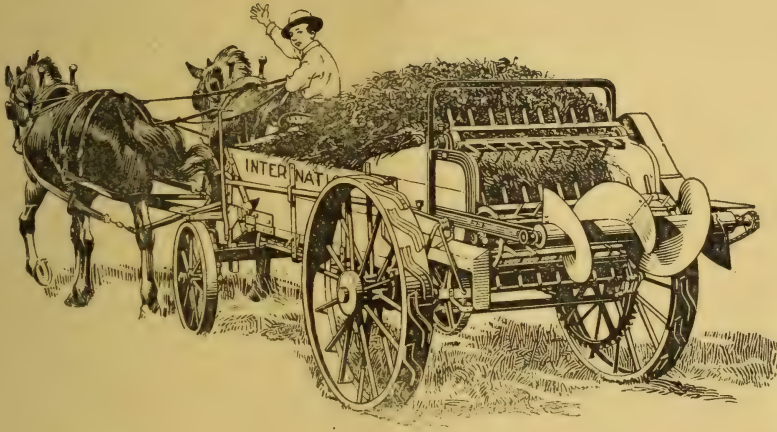
The Cleveland Tractor Co.

Largest Producers of Tank-Type Tractors in the World

19123 Euclid Ave.,

Cleveland, Ohio

The New International Challenges Your Criticism!



Anything Missing in This List?

1. **Roller Bearings**—Roller bearings at seven points—the only spreader so equipped.
2. **Double Ratchet Drive**—Walking beam transmission from main axle eccentric and extra large ratchet wheel give easy, strong, steady feed. Box tapered to eliminate friction on box sides. Six feed speeds.
3. **Oscillating Front Axle**—Auto-type, permitting short turn. No pole whipping.
4. **Power; Both Wheels**—Power is transmitted from both ends of the rear axle—beaters and wide-spread driven from one wheel and the manure feed from the other.
5. **Wheels Track**—Rear wheels track with the front wheels, lightening draft.
6. **Tight Bottom**—There is no clogging, jamming apron, because the spreader has a tight bottom. Spreads anything.
7. **Two Beaters**—Two all-steel beaters with chisel-pointed square teeth work from both top and bottom of the load.
8. **Wide-Spread**—The spiral behind the beaters gives the manure a third beating, and spreads it finely and uniformly beyond the wheels.
9. **All-Steel Main Frame**—Wood box sides hold only the load.

For complete descriptive information address

INTERNATIONAL HARVESTER COMPANY
 CHICAGO OF AMERICA INC. U S A

CORN CLUB WINNERS

Steuben County, Preston Moody.

Blackford County, Chas. Clamme, Jr.

Union County, Hubert Jones.

Lawrence County, Gilbert May.

Jefferson County, Paul Holcroft.

Preston Moody is the winner of the state.

ALPHA ZETA INITIATION

The fall initiation of Alpha Zeta was held Wednesday, December 17, 1919. This is somewhat later than usual but it was thought wise to hold it later because of other activities of some of the pledges that could not be interrupted. Eight men were initiated, five seniors and three juniors. They were H. L. Bundy '20, J. L. Fausset '20, H. W. King '20, O. R. Riggs '20, E. F. Ripley '20, H. R. Hofford '21, A. K. Mackey '21, and R. F. Meade '21.

FARMERS BANQUET IN PURDUE ARMORY

During Farmers' week at Purdue, January 12-16, the farmers held a very extensive banquet in the Purdue Armory. Dean Stanley Coulter acted as toastmaster and in his speech stated that the church, the home, and the school are the great fundamentals of social peace. Professor T. F. Moran also gave a very interesting talk and explained that the present unrest was a common movement that followed every war and that we needed to thoroughly Americanize our own Americans as well as foreigners. Dr. Allen B. Philputt, pastor of the First Christian Church of Indianapolis, spoke on "Citizenship," whose talk was also much appreciated by the farmers.

The beef cattle barn was completed December, 1919, and serves a purpose that has been felt for a long time. It is a frame structure with tile roof, stucco finish, and concrete and clay floors. The main building is 92 feet by 65 feet with wings on either side that are 68 feet by 34 feet. This building contains 65 single stalls and 20 box stalls. The feed and storage rooms, grain elevator and grinding machinery, scales, and the large space for hay and other roughages makes the barn a very desirable structure.

There are also two 16 feet by 59 feet silos built in connection with this structure. Light, ventilation and sanitation are factors that are well taken care of, and the building as a whole is very satisfactory.

The first prize ham at the Ham and Bacon Show held at Purdue during the Farmers' week was exhibited by Elmer P. Cutsinger, of Edinburg. This ham was sold at auction January 16 for \$1.05 per pound. The 11 pound ham sold for \$11.55.

The first prize bacon was also exhibited by Mr. Cutsinger and sold for \$1.14 per pound.

FIVE ACRE CORN CONTEST WORK IN INDIANA.

(Continued from page 247)

tions. These are fundamentals for increasing corn yields. Ear-to-row breeding plots have been held in connection with the Five Acre work in some sections with the viewpoint of planting their Five Acre plots the following years from the ear-to-row corn.

County meetings will be held this winter and spring at which time these principal factors in corn improvement will be discussed and methods worked out by the farmer whereby he may be able to increase his yield the following year.

GENERAL FARM RECORDS.

(Continued from page 250)

The records described above also enable a person to make his income tax report with greatest ease. Two methods of reporting the farm income for taxation are in use. A farmer may report the difference between the cash sales and expenses without regard to inventories or the inventories may be included. By the first system the aggregate income for a period of years is correct, but the distribution of the income from year to year is often wrong. As an example, a person may hold over his 1918 crop and sell it and his 1919 crop during 1919. Both would then be reported as income for the same year which might bring the income up high enough so that it would be taxed, while if the 1918 wheat had been credited to the 1918 business during which year it was really produced,

John Deere Full Line of Farm Implements

Binders	Hay Loaders
Buggies	Hay Presses
Corn & Cotton	Hay Rakes
Planters	Hay Stackers
Corn Shellers	Listers
Cultivators:	Manure Spreaders
Alfalfa	Mowers
Walking	Plows:
Riding	Walking
Two-row	Wheel
Feed Mills	Tractor
Grain Drills	Stalk Cutters
Grain Elevators	Wagons
Harrows:	Farm Engines
Disc	Farm Tractors
Drag	
Spring Tooth	

Get Full Performance from Farm Implements

Your farm implements, taken all together, form a great crop-making machine, each part of which is dependent on the other. The whole is no better than the poorest implement in it.

Poor seed-bed making by an inferior plow, for instance, will make it impossible for your planter and cultivator to give the profit that they should give.

Likewise, inaccurate planting will lessen the returns from the best of seed beds and thorough cultivation.

And a cultivator that will not destroy weeds and conserve moisture without injuring the crop plants cuts the profit from the use of your other implements.

Get full performance from every one of your implements.

You can do that by specializing in the use of John Deere implements.

There is a John Deere implement or machine for practically every farming operation. Look over the list above. These implements are the product of 83 years of successful experience in meeting the requirements of farmers in all sections. They are built to maintain the long-established John Deere reputation for giving the user the greatest final returns on his investment.

When you leave school and start to farming for yourself, make your John Deere dealer's store the gateway to an especially satisfactory investment—a John Deere implement for every one of your farming operations.

John Deere, Moline, Illinois

Natco Dairy Barns Are Warm in Winter

NATCO barns are warm in winter, yet cool in summer. They provide year-round comfort for your cows. More comfort in the stable means more milk in the pail—more money in the bank.

The hollow spaces in a glazed Natco Hollow Tile wall provide a blanket of still air through which heat, cold or dampness will not pass.

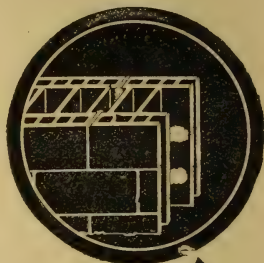
And the cost? Perhaps a little more at first, but *far less* in the end than for other construction. The saving in insurance and upkeep will repay the added investment within a few years. All further savings are clear profit.

Whatever you intend to build, our book, "Natco on the Farm," will offer helpful suggestions. Write for it today—*no charge*.

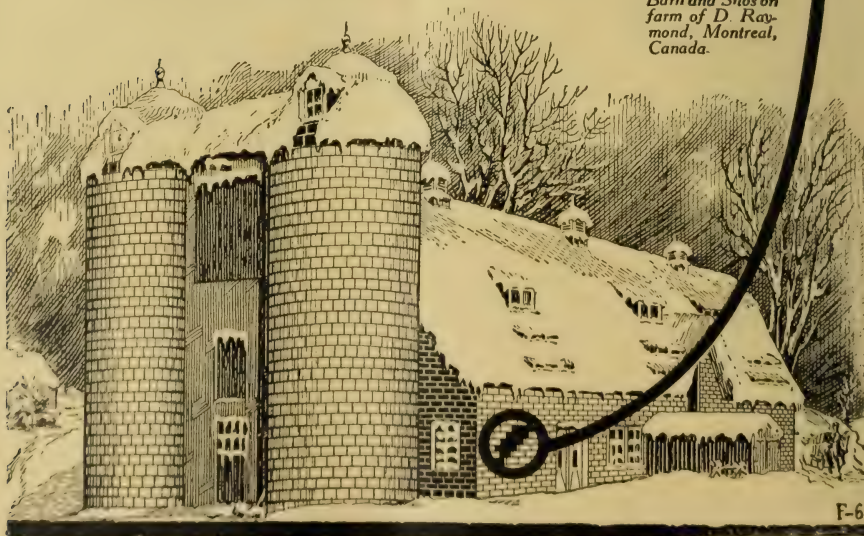
Ask your building supply dealer to quote you prices on Natco Hollow Tile.

National Fire Proofing Company
1221 Fulton Building
Pittsburgh, Pa.

23 Factories assure a wide and economical distribution.



Section of Natco Wall showing still air spaces.



Barn and Silos on farm of D. Raymond, Montreal, Canada.

Manufacturers of

Indiana Farm Wagons,
Farm Trucks and
Extra Boxes

State Agents For

Master Trucks
1½ to 5 Ton Capacity
Winton and Scripps-Booth
Six Cylinder Automobiles
Write For Prices

The Indiana Wagon
Company

South Street and Belt Railway, LaFayette, Indiana

DAN W. TIBBS

HARLEY R. DRAKE

JOHNSON, TIBBS & DRAKE

LIVE STOCK COMMISSION

Indianapolis Union Stock Yards

United States Food Administration License No. U-1876.

Rooms 1 and 3 Exchange Bldg. Both Long Distance Phones 1866.
Night Phones—Irvington 264, Belmont 2668.

D. W. Tibbs, Hogs. "Scott" Kelly, Wagon Hogs. H. R. Drake, Office.
J. R. Wilhite and A. W. Wade, Cattle, Calves, Sheep

Burpee's Seeds Grow



BURPEE'S ANNUAL

Burpee's Annual is a complete guide to the vegetable and flower garden. It fully describes Burpee Quality Seeds with a hundred of the finest vegetables and flowers illustrated in the colors of nature. If you are interested in gardening, **Burpee's Annual** will be mailed to you free. Write for your copy today.

W. ATLEE BURPEE CO.
Seed Growers Philadelphia, Pa.

BURPEE'S ANNUAL FOR 1920
The Leading American Seed Catalog

AGRICULTURAL LIMESTONE



WRITE FOR SAMPLE AND PRICE

A. & C. Stone and Lime Co.

GREENCASTLE, INDIANA.

RIDGEVILLE, INDIANA

General Office
INDIANAPOLIS, INDIANA.

Over Forty One Million Dollars!

An enormous sum
—and yet,
large as it is—

We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the SEVEN largest Live Stock Commission Houses on the Chicago Market and we are also one of the SEVEN largest Houses on the Kansas City market.

We sell the experimental and fat cattle for the Animal Husbandry Department of Purdue University, Illinois State University and the Missouri State University and also the Experimental cattle from Worcester, Ohio.

LET US HANDLE YOUR NEXT SHIPMENT

Alexander Conover & Martin

LIVE STOCK COMMISSION

U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

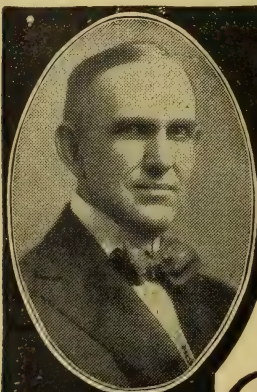
the income would not be high enough either year to be taxed. The most satisfactory method is therefore the inventory method. The simple financial records of cash receipts and expenses with inventories as mentioned above are all that are required for such a report.

A farm record book designed for keeping records of this kind has been prepared and printed by the Extension Department of most of the State Agricultural Colleges. Such a book has been available in Indiana for the past four years. About 30,000 copies have been distributed largely through the banks of the state for use during 1920. Additional books are being distributed at cost from the Extension Department, Purdue University.

BASKETBALL RESULTS

Purdue.....	27;	Em-Roes	24
Purdue.....	51;	New Castle	16
Purdue.....	19;	C. of C.'s	13
Purdue.....	22;	K. of C.'s	27
Purdue.....	34;	Wabash	38
Purdue.....	31;	Illinois	33
Purdue.....	42;	Notre Dame	19
Purdue.....	27;	Indianapolis	14
Purdue.....	35;	Ohio State	37

We hated to give up the game at Urbana when Lambert's battling five came out with the short end of the score 33-31 after leading during the entire first half. The team deserves credit for a hard fought battle with one of the best teams in the conference.



Ditching and Soil Washing Problems Solved

LET me show you how to solve the drainage, irrigation and soil washing problems at low cost. I'll show you how two men can now do more ditch work than 100 men by old methods. This is the year to save labor and do this work swiftly and efficiently. I'll show you the way. Write for the new book that tells the story.

I Want You to Know Facts

Cuts V-shaped ditch for open drainage, irrigation or tile any depth down to 4 feet, leaves smooth, hard sides. Also use it for back-filling tile ditches and holes. Perfect machine for cleaning old weed-clogged ditches. **All steel—reversible to throw dirt either side. Adjustable for narrow or wide cut. No wheels, cogs or levers to get out of fix. Lasts a lifetime.**

Farm Terracing

Builds farm terraces which stop washing of soil on rolling and hillside land and hold the water where it should remain; reclaims abandoned washed land; throws up dikes and levees; grades roads; works in any soil, wet or dry; 2, 4 and 6 horse sizes; large size fine for tractor. Needed on every farm.

Get Your Farm in Shape

Chance of a lifetime to make big money the next five years. Here is crop insurance at a low cost. Write and find out how to make big crops sure. New free book on drainage, irrigation and terracing. Write for this and our proposition. Address W. A. Steele, Pres.

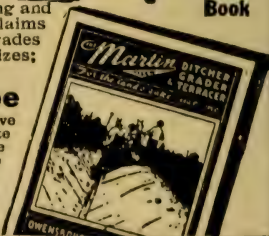
OWENSBORO DITCHER & GRADER CO., Inc.
Box 232, OWENSBORO, KY.

THE Martin
O.D. & G. CO. REGISTERED

Farm Ditcher, Terracer & Grader



Get This Free Book



SOLD ON 10 DAYS TRIAL

BOYS AND GIRLS POULTRY CLUBS

To secure good results you must be well informed, be practical.

Boys' and Girls' Clubs will succeed with their flocks, and learn money-making methods by following the advice given by reading the

INLAND POULTRY JOURNAL

Read our instructions regarding the care of your flocks.

Send your subscriptions today.

Indiana's oldest and best poultry journal.

Price one year 50c, three years \$1.00.

Address---25½ East Washington Street
INDIANAPOLIS, IND.

Smoke Your Own Meats

IN THE EUREKA Portable Smoke House

With this wonderful smoke house, home curing, smoking and storing of hams, bacon, sausage and fish become practical and easy.

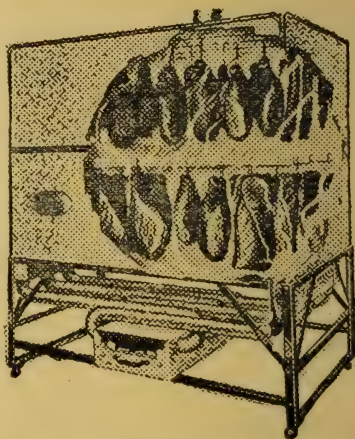
It is compact and can be taken through an ordinary door. Made in all sizes, ranging from two-hog capacity on up.

Can be operated from chimney same as stove and requires very little attention. Smoke goes through an air-cooled radiator before reaching meat, and can not overheat.

Glass doors, to watch operation, absolutely fireproof, complies with all fire insurance laws, saves money and does the work very satisfactorily.

Write today for circular explaining the greatest common sense smoke house built right here in Indiana.

Guaranteed by manufacturer for at least 20 years. We have some desirable territory open for live dealers and agents in Indiana.

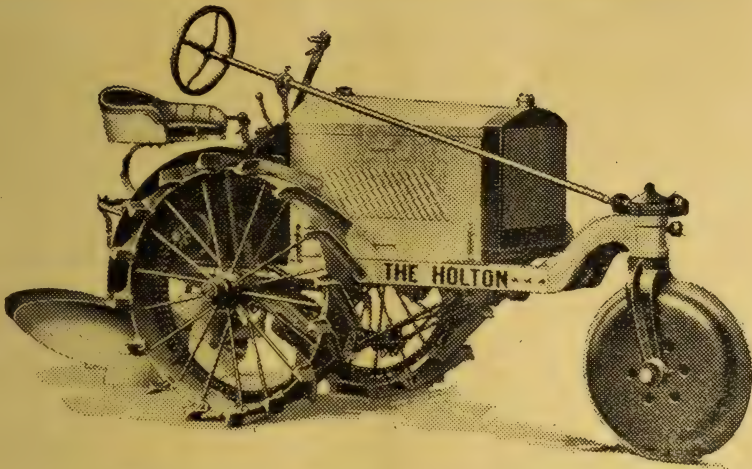


Sectional View of the Eureka

O. K. SLATER

49 $\frac{1}{2}$ SOUTH DELAWARE ST.

INDIANAPOLIS



*This is the Tractor for which the
farmer has been waiting.*

DEALERS WANTED

FOR THE

HOLTON TRACTOR

*Plows built into the machine.
Plows square corners, finishing field as
you go along.
Can't rear up in front.
One man machine for all purposes.
Economical, simple, moderate priced.*

ITS STOCK A PRIME INVESTMENT. LIMITED AMOUNT
NOW BEING OFFERED

THE HOLTON TRACTOR CO.

3537 East Washington St.

INDIANAPOLIS, IND.

Cesspool and Stream Pollution Now Stopped

A Septic Tank That Never Needs To Be Cleaned Out.

DESTROYS ALL SEWAGE.

Several years ago an Indianapolis manufacturing company sent an advertisement to a leading farm paper, claiming to manufacture a septic tank for sewage disposal which would "never have to be cleaned out." The publishers of the paper sent the advertisement back, saying they could not print it because such a tank could not be made.

It does sound impossible, doesn't it? A tank that would receive and destroy all house sewage for years and years and years—a whole lifetime—without ever having to be cleaned out! But the manufacturer referred the farm paper to the state college agricultural department. And the college authorities wrote back—"The claim is true—The Perfection Septic Tank DOES destroy all sewage and NEVER has to be cleaned out."

Since that time, the Perfection Septic Tank has been installed on farms all over the central west—and has ENDED the sewage disposal problem in every case. No more cesspools! No more pollution of Streams! The farm home can now have all the modern sanitary advantages of the city dwelling.

The cost is small for such a valuable health safeguard. No chemicals are required. This tank destroys sewage by the natural action of the bacteria contained in the sewage itself. Only clear water leaves the tank—odorless and harmless. Can be allowed to flow into stream or seep into the ground.

Easy to install, the Perfection Septic Tank is simply connected with the house drain—and takes all sewage from bathroom, toilet, kitchen and laundry.

For full particulars and price, you may write to the United Cement Products Co., 217 Board of Trade, Indianapolis. Descriptive circular with illustrations, price and interesting information will be sent to you at once.—Adv.

HOME CURING OF MEATS—PORK.

(Continued from page 260)

quent stirring will be necessary to prevent burning. When done, remove from the stove and allow to cool slightly, and then strain through a muslin cloth into a large jar. Stir it occasionally until it is cool enough to begin to solidify. If pails or smaller jars are to be filled, the lard should be dipped out while just warm enough to be liquid. Stirring while the lard is cooling tends to whiten it and makes it smother. Lard should be stored in a dry, cool, dark place. Light, moisture, and high temperature affect its quality unfavorably.

Sausage

Sausage.—Pork sausage should be made only from clean, fresh pork. The shoulders, neck, and lean trimmings are usually used for sausage. Unless part of the fat is removed and used for lard the sausage is likely to be too fat. To each eighteen pounds of lean meat allow six pounds of fat. Mix the fat and lean meat together in chopping. Where a rotary cutter is used it is best to cut the meat twice. After it is cut the first time, spread it out thinly and season. Eight ounces of pure, fine salt, four ounces of ground black pepper, four ounces of pure leaf sage, rubbed fine, and one teaspoonful of red pepper to each twenty-four pounds of meat will suit the taste of most persons. The seasoning should be sprinkled thinly over the cut meat and the meat again run through the cutter to mix the seasoning thoroughly. This method will give a more even mixing of the spices than can be obtained by working it with the hands. For immediate use the sausage may be packed away in stone jars or crocks, to be sliced for frying. Many people stuff it into casings made from the small intestines of the hog. When this is done the intestines must be turned inside out and carefully cleaned.

A good substitute for casings may be had in narrow muslin bags. These, when filled, should be two and one-half or three inches in diameter and eighteen to twenty-four inches long. Stuff the sausage in tightly by hand and hang in a cool place. If the sausage is to be kept for some time, melted lard should be

Why Did You Go to Purdue?

*Was it because of a desire for higher education
created by your district school?*



BOYS AND GIRLS
NEED MORE THAN
"READIN', 'RITIN'
AND 'RITHMETIC."



AN AID TO TEACHERS OF AGRICULTURE

The Rural Schools Bulletin, published monthly by Successful Farming, and sent free to teachers in the Central States, contains lessons on agriculture for primary, intermediate and advanced grades. These lessons help to inspire the pupils with the possibilities of profit and pleasure in farm life. They teach the youngsters new and practical things about crops and soils, livestock raising, and farm home making. They create and intensify a desire on the part of the pupils to get the very best agricultural education possible.

Teachers are enthusiastic about the bulletins, because they find them of real help in teaching agriculture. Pupils in schools where these bulletins are used, take a lively interest in the study of agriculture, and a greater interest in all other school work. We shall be glad to send it to any college student who asks for it.

This is but one of many special services provided by Successful Farming for the benefit of its readers, and for the cause of better agriculture. Agricultural students, farmers, and all others interested in agriculture, will find Successful Farming a worthwhile addition to their reading tables. The subscription rate is reasonable—\$1 for three years. Sample copy on request. Write us today while you have the matter in mind.

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105 SUCCESS BUILDING

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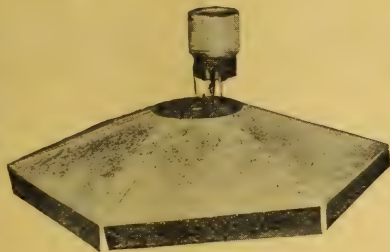
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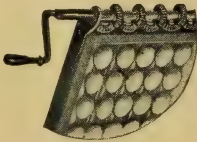
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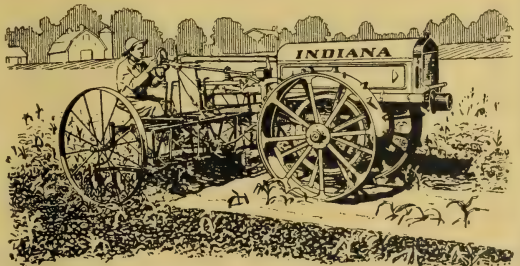
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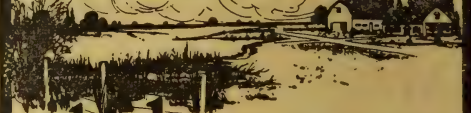


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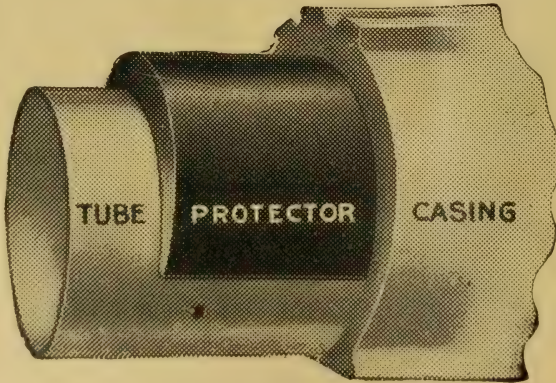
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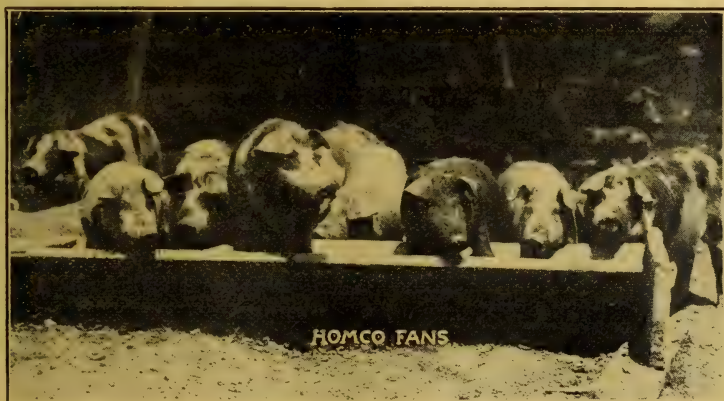
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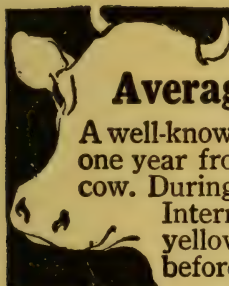
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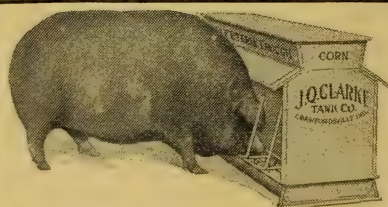
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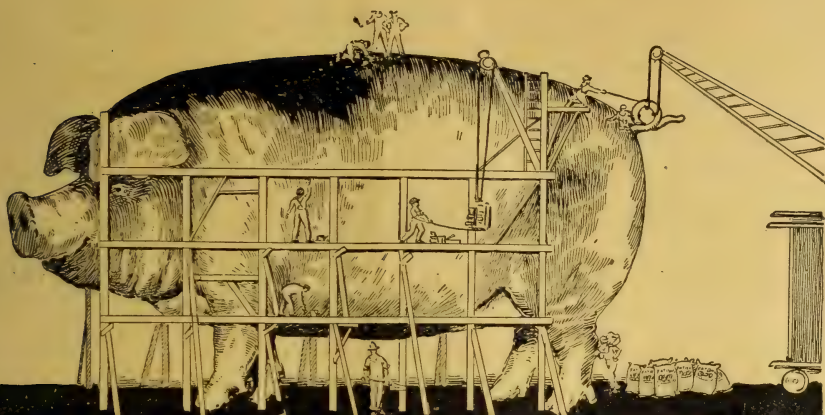
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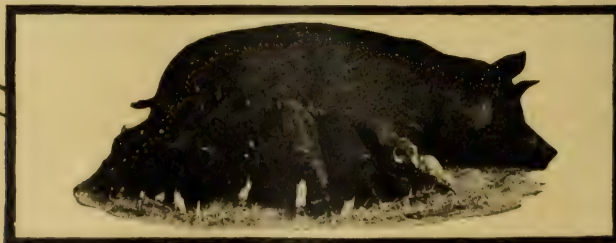
The care and feed given the sow from the time she is bred until she farrows and then, both sow and litter until weaning time, has much to do with the profits you make from your hogs. If your sows are fed and handled right, bigger, stronger litters are sure to come. The pigs will thrive better, grow vigorously right up to weaning time. Then, if given the proper growing feed, pasture and exercise, bigger frames, heavier bone and better finish, with bigger profits, will result.

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The PURDUE AGRICULTURIST

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MARCH, 1920



Vol. 14 No. 6

Put your chicks on this schedule

If you expect to have layers in December your chicks must be properly developed during the first six weeks. They must be supplied with the same balance of nutritive elements that they got from the egg for their first nourishment. Put your chicks on the following schedule and reap the profits that come from sturdy winter layers.

FIRST WEEK

Do not feed chicks at all for forty-eight hours. Keep them warm and dry. Nature has provided a feed for the first few days in the form of the remainder of the yolk of the egg which is drawn to the little chick's body just before it breaks the shell. After the second day feed Purina Chicken Chowder, dampened with warm water, sweet milk or fresh buttermilk until crumbly, five times a day—at 7:00, 9:30, 12:00, 2:30 and 5:30 o'clock. Do not shift from sweet to sour milk, or vice versa. Feed only as much as will be cleaned up. Remove and destroy damp Chowder after fifteen minutes.

SECOND WEEK

Replace the night meal with Purina Chick Feed, throwing it in a shallow litter of clean hay or straw. Continue four feedings a day of the damp Purina Chicken Chowder.

THIRD TO FIFTH WEEK

Discontinue the damp Purina Chicken Chowder, keeping dry Purina Chicken Chowder before the chicks in an open hopper all the time. Throw as much Purina Chick Feed in the litter as will be eaten up clean four times a day. Get the chicks out of doors, on the ground, if the weather is warm and dry. Avoid dewy grass and keep the feathers dry. Keep the chicks hungry.

SIXTH TO TENTH WEEK

Change gradually from Purina Chick Feed to Purina Scratch Feed, mixing a little more Scratch Feed with the Chick Feed each succeeding day. Feed the grain feed in a litter three or four times a day. Keep dry Purina Chicken Chowder before the chicks all the time.

After the first week supply plenty of fresh greens all the time. Keep the water basins absolutely clean and filled with fresh water. Supply plenty of fine grit (coarse sand may be used the first week or two instead). Some poultry raisers keep fine ground limestone or oyster shells in hoppers.

Double Development or Money Back Guaranteed

The money paid for Purina Chicken Chowder will be refunded if baby chicks when fed Purina Chicken Chowder with Purina Chick Feed, as directed, do not develop twice as fast during the first six weeks as when fed a grain ration.

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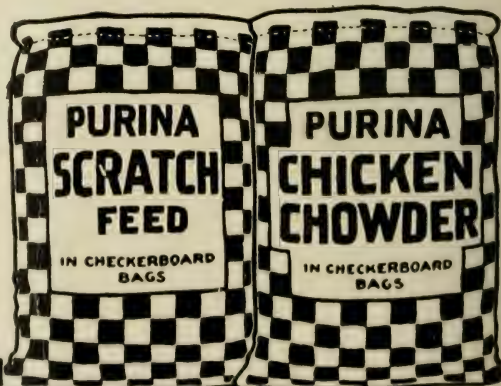
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*Sold in
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**Don't take chances
on losing your pigs!**

**TREAT YOUR PIGS NOW—
USE THE BEST**

Serum and Virus

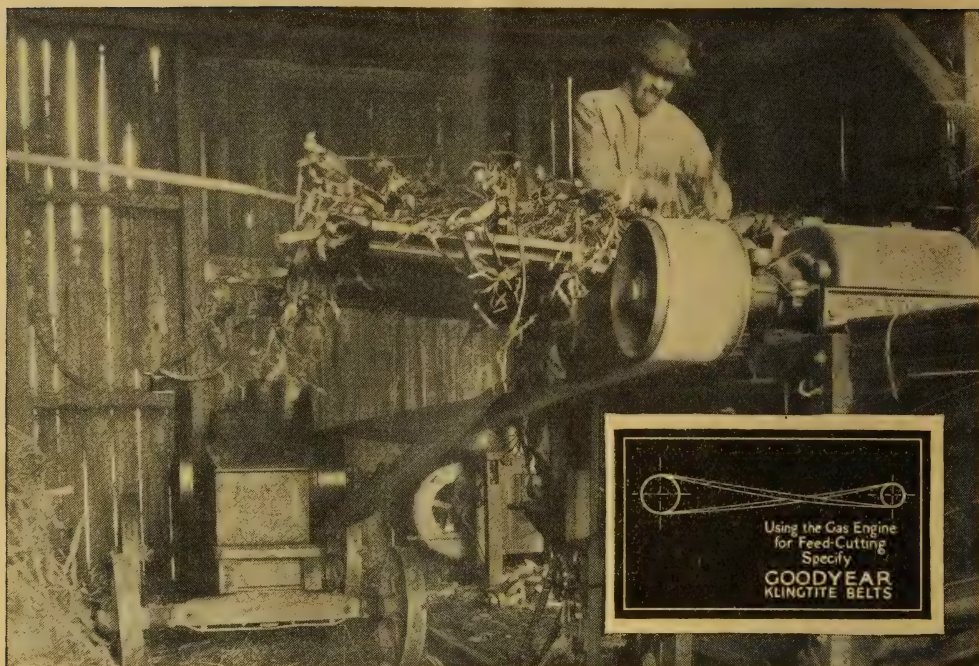
The Single Bled from the Swine Breeders Pure Serum Company saves your hogs. Experience has proven it to be **the best**. We can supply your wants at once.

Prompt attention given to all orders.

Don't wait until you get disease in your herd. Save trouble and loss by treating your pigs now while they are well. Write.

**Swine Breeders Pure
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THORNTOWN, INDIANA



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All-Weather Work With Goodyear Belts

The revolving year turns a succession of tasks to the farmer's hand, and with every season re-emphasizes for him the value of time. Every limit set on the full use of his time is a limit placed on his production, with higher cost of farm operation as a direct result.

Consequently, one of the factors in the farmer's investment in a piece of machinery is its all-season, all-weather utility. The fewer days it is idle because its action is affected by cold or wet, or because its work is confined to planting time or harvest time, the more valuable its place as help on the farm.

Belts that run trouble-free in the alternating dry cold and damp cold of winter are extending the all-season use of power equipment on the American farm. Moisture-proof Goodyear Klingtite transmission belts are serving under climatic conditions that seriously crippled the efficiency of belts that by turns froze into rigid strips, and shrunk so appreciably as to compel

frequent re-setting of the engine.

The qualities of Goodyear Klingtite in winter work are demonstrated, for instance, in the experience of Charles Tagge, of Seymour, Wis. Mr. Tagge has farmed the same good piece of land for 20 years—and he's had full opportunity to compare belting values. He remarks particularly on the free-swinging action of his Goodyear Klingtite, however cold the day; its secure, friction-surface grip on the pulleys, regardless of the moisture content of the air; its freedom from slippage, even when the shredder clogs; and its steady record of fuel saved and full power delivered.

Items of real economy, reducing the high cost of operation, these standard qualities of Goodyear Klingtite Farm Belts are gone into in detail in the Goodyear Farm Encyclopedia. Students and teachers of agriculture are supplied with copies on request to the Mechanical Goods Dept., Goodyear Tire & Rubber Company, Akron, Ohio.

KLINGTITE BELTS HOSE · PACKING
GOOD YEAR



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The kind of hitch not to use. Four abreast causes side draft and crowding.
The two center horses get hot quickly.

THE PURDUE AGRICULTURIST

VOLUME XVI

MARCH, 1920

NUMBER 6

Multiple Horse Hitches

Prof. Aitkenhead

Head Farm Mechanics Department

WITH the necessity for greater food production the American farmer is confronted with the problem of making his efforts count for the most. The first necessity for greater production is the efficient use of more power. In some cases this demand for more power is met through the use of tractors, and this is very good when both the farmer and his farm conditions are suited to tractor operation. But in many cases, due to the lack of mechanical knowledge by the farmer, the topography of the land or the number of young horses on hand the use of the tractor is not so satisfactory as the use of horses. The farmer working under such conditions must utilize the power of a greater number of horses, controlled by fewer men in order to compete successfully with his neighbor, the tractor farmer. The efficient use of an increased number of horses involves a large number of important problems, one among them being the problem of securing efficient hitches whereby the pull may be equally distributed between the animals, each working under favorable conditions and the hitch so adjusted that the load will be pulled with the smallest expenditure of effort consistent with good work.

In designing any hitch due consideration must be given to the following points:

Number of horses required for good work;

Equalizing the pull between the horses;

Method of driving the horses;

Securing favorable conditions for the horses to work under;

Elimination of "side draft."

These problems are found in varying degrees of importance in the use of all

implements. However, the principles underlying the application of the hitch to one implement are fundamentally the same for all implements.

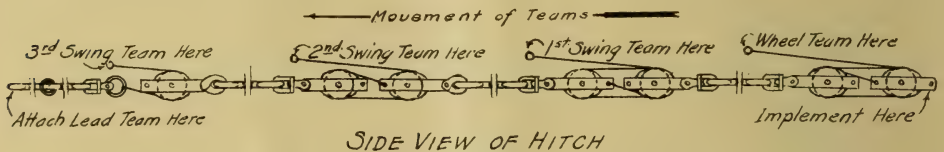
The moldboard plow is the most important soil-preparation implement, as well as the most perplexing to operate properly. Since it is known that most of our present plow troubles are due to improper hitches the consideration of the problem as stated will be with reference to that implement.

Under average conditions, plowing at a depth of six inches, the draft of a 14-inch single-bottom plow varies from 300 to 400 pounds and may increase to 700 pounds or more when the soil becomes dry. A horse working at the rate of 2.5 miles per hour can exert a pull of 1-10 its weight. Under favorable conditions then it will require two 1,500 pound horses to operate a 14-inch plow, and when plowing becomes hard at least four such horses should be used for this work. At present the abreast hitch is standard for plows. With this style equalizer it is impossible to use three horses on a sulky or four horses on a gang plow (no horses walking on the plowed ground) without causing "side draft." Not only does abreast hitching increase the draft of the plow from 15 to 30 per cent, but the horses are crowded, which leads to tramping and excessive heating. Side draft can not be eliminated in this type of hitch without working some of the horses upon the plowed ground. Therefore, in order to secure an equalizer which is desirable both from the standpoint of the horse and the implement some form of tandem hitch must be used. Hitches based on this plan have been devised which eliminate "side draft" and give the horse abundant space in which to work.

In designing these hitches due attention has been given to the demands that naturally come from the various sections of the country. For example, in the East it is desired to use four horses; in the Central states six, and in the far West eight or ten. Simplicity was striven for with the result that a hitch has been developed which can be used for two, four, six, eight or ten horses by merely selecting the proper units. A diagram of this equalizer is shown in the figure, assembled as the ten-horse hitch. The horses are worked in pairs. When plowing one horse of each team walks in the furrow. The lead team works against the third swing team and the pull between these two teams is equalized by a two-foot chain passing around a pulley. From one end of this chain a

is attached to the plow. The wheel team is attached to the free end of the chain with which these blocks are threaded. This hitch then consists of a series of block and tackles so arranged that each team works against the team or teams ahead of it and is for use on a three-bottom gang plow. The proper length of double-trees to use is given at the end of this article. Too much emphasis can not be laid upon the necessity of using the lengths of eveners specified if "side-draft" is to be eliminated.

Objections are frequently made to the tandem style of hitch on the grounds that the draft of the load is increased. Such objections are not well founded since field experience shows that the draft is not increased and that this hitch gives a much better alignment of the



draw-rod eleven feet long goes to the lead team. The third swing team is attached to the other end of the chain. The lead team and the third swing team work against the second swing team. The pull is equalized by a block and tackle placed immediately behind the second swing team. This block and tackle consists of one movable and one fixed pulley. A draw-rod eleven feet long leading ahead is attached to the movable pulley. A chain three feet, six inches long is threaded through the pulley. The second swing team is attached to the free end of this chain. The first swing team works against the three teams ahead of it. The pull is equalized by means of a block and tackle consisting of a movable, single-pulley block and a stationary double-pulley block. The first swing team is attached to the free end of the chain with which this block is threaded. The wheel team works against the four teams ahead of it. The pull is equalized by means of a block and tackle, consisting of one double-pulley, movable block and one double-pulley, stationary block which

tugs, thus removing the majority of sore shoulders. Also it is claimed that the teams can not be driven satisfactorily, however, a system of driving has been used by the farmers of the Pacific Coast for a number of years and has been found very successful when used in connection with this hitch. The system was described by Professor Potter, of the Oregon Agricultural College, as follows: The lead team is the only one on which the lines are used. The furrow horse from each of the remaining teams is tied in to the draw-rod with an ordinary lead strap and his mate tied to his hame ring. "Bucking-back" is accomplished by fastening each end of a strap ten feet long to the bit rings and extending it back over the top of the collar between the hames. A ring rides free on this strap to which a single strap is fastened. The other end of this strap is attached to a strap on the draw bar. The hitch is so designed that when any team pulls forward the draw rod is pulled back, which tightens the buck strap and thus

holds the team from going ahead. It is very important that the buck straps be so adjusted that the team is checked just before it reaches the forward end of the play allowed by the equalizers.

By dropping off the rear units this hitch can be readily converted into an eight, six or four horse equalizer. If it is desired to hitch more than two horses abreast in the team as might be done in hitching to the disc harrow one may hitch, by use of a single unit, two four horse teams with one in front of the other. In this case driving would be done in the same manner as before. Thus it is possible to hitch in many different combinations in all of which "side-draft" and crowding are eliminated. These methods of hitching and driving horses are relatively new, especially in the Central and Eastern part of the United States. They are offered to the public only after careful experimental work and a thorough study of all the details. It now remains for the practical horsemen to put them into general use for the purpose of determining just which units are best adapted to meet the needs of different communities and sections of the country.

Width of eveners to use with different implements. All measurements given

from center of outside hole to center of outside hole. Singletrees 30 or 36 inches long should be used.

Plow Hitches.

- Ten horse hitch (2, 2, 2, 2 and 2)
 - 3-bottom 42-in. plow, eveners 60 inches.
 - 3-bottom 36-in. plow, eveners 50 inches.
- Eight horse hitch (2, 2, 2 and 2)
 - 3-bottom 42-in. plow, eveners 60 inches.
 - 3-bottom 36-in. plow, eveners 50 inches.
- Six horse hitch (2, 2 and 2)
 - 3-bottom 36-in. plow, eveners 50 inches.
 - 2-bottom 28-in. plow, eveners 46 inches.
- Four horse hitch (2 and 2)
 - 2-bottom 28-in. plow, eveners 46 inches.
 - 2-bottom 24-in. plow, eveners 40 inches.
 - 1-bottom 16-in. plow, eveners 36 inches.

Disc-Harrow Hitches.

- Eight horse hitch (4 and 4)
 - Use 80 inch eveners.
- Six horse hitch (3 and 3)
 - Use 60 inch eveners.

Wagon Hitches.

- Use ordinary wagon equalizer.

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Continuous House Cleaning

HAVE the warm spring days made you think about housecleaning?

If so, have you stopped to consider whether it is necessary to do the work or whether you are doing it just because you have formed the habit of doing so each year at this time? Many modern houses are kept so well through the year that the general tear-up of housecleaning can be left off the list of necessary household tasks. The hardwood floor should be cleaned when necessary and polished often enough to keep it in good condition; rugs have to be thoroughly cleaned oftener than once or twice a year; curtains must be washed every month or two if they are kept in a sanitary condition; and walls, woodwork and windows ought to be cleaned when they need it. More and more wo-

men are managing the cleaning in their homes so that it is not necessary to inconvenience the family and to wear out the housekeeper by trying to get all of the dirt that has accumulated during the winter months out of the house by one week of strenuous work.

In housekeeping many of the tasks we perform and the processes we use are done because we have formed the habit of doing them. Is it not time for the modern housekeeper to consider the situation carefully and determine whether the old was is the best?

A great many housekeepers do their cleaning with the most antiquated of equipment. Old brooms that are worn to a point are used when a good carpet sweeper, or vacuum cleaner would be much easier and would accomplish bet-

ter results. The carpet sweeper removes surface dirt from a rug or carpet without making any dust. The vacuum cleaner removes the surface dirt, and the dust in the rug or carpet as well. While the initial cost of the vacuum cleaner looks large yet the energy saved is worth the money. The housewife in selecting a vacuum cleaner should consider the weight of the machine, the ease with which it can be cared for, the size of the slab in the suction end, the method arranged for handling and operating so that the slot is kept on the floor and the ability of the machine to remove dust from the rug or carpet. Hand power vacuum cleaners may be purchased and do very effective work, but require a large amount of energy in their operation. A vacuum sweeper would perhaps be the best hand power device to choose since it require less strength in operation. However, it does not do as effective work as the vacuum cleaner.

In addition to this equipment good brooms and brushes would be necessary. Brooms should either be hung or placed broom end up when not in use as this makes for longer wear. A radiator brush is a great help in cleaning. Scrubbing brushes are necessary and a brush for cleaning the flush closet in the bathroom should be in every cleaning outfit.

Long handled dustpans prevent stooping, but they cost about double the ordinary dustpan. Dust mops should be used on all wood floors that are waxed, oiled, painted or varnished. These mops are treated with oil which catches and holds the dust. It is necessary to wash them occasionally and when dry to sprinkle oil on them again, being careful not to use too much.

If a rug or carpet needs beating it should be laid face down on the ground and beaten with a carpet beater. Never hang one on a clothes line for beating if there is sizing on back, as this breaks the sizing and injures the rug. Small rugs should always be rolled and not folded for the same reason.

A mop wringer is a great saver of hands when used with the scrubbing mop. Be careful to select mop and wringer to fit each other.

In doing the dusting avoid using any material that scratches furniture or woodwork. Outing flannel is a good material to purchase if anything must be bought. The legs of silk or cotton stockings split, or the top of jersey petticoats make good materials for dusters. The feather duster should be avoided as the dust removed from one part of the room with the feather duster settles down again somewhere else. Too much furniture polish or furniture oil should not be used on well finished furniture as it eventually forms a gummy like coating. Outing flannel bags made to slip over a broom with a draw string to fasten around the handle are very good for wiping down cob-webs or dust on walls or woodwork.

In cleaning woodwork use clear warm water. Apply to the wood and wipe dry immediately. One preparation recommended for cleaning varnished or waxed hard wood is as follows: Mix one quart of boiling water, five tablespoons boiled linseed oil and one tablespoon turpentine. Apply to a small surface of wood and wipe dry immediately. When the liquid becomes soiled make a new quantity, as it is not effective if dirty. Windows are most easily cleaned with some prepared cleaning powder or paste as the use of soap and water often causes a film to form on the glass. Glass may be polished with old newspapers or a piece of chamois.

Every housekeeper must do a large amount of cleaning if her house is kept in order. Would it not be a wise plan to do special cleaning whenever it is needed, rather than wait until a certain week in the fall or spring and then do work that could have been scattered through the year? If the housekeeper's equipment is of the efficient type and her work well planned she will find that much of the work included in "spring housecleaning" can be done at other seasons of the year.

"How long must one beat a cow," inquired the city girl who was visiting at the big Holstein farm, "before she will give that delicious whipped cream?"—*Holstein-Friesian World*.

Mating Poultry for High Egg Production

By Roy E. Roberts, '21

THE aim in breeding poultry for high egg production is to develop a flock of birds which will produce the largest possible number of eggs during the winter season, when prices are highest, and also do this with as low a cost in feed and labor as possible.

most important to keep constantly in mind constitutional vigor. Careful selection for constitutional vigor offers one of the best opportunities for increasing the profits of most poultry flocks, for it is often the case with utility flocks that too much attention is given to the comb



Two Extremes. Which Would You Want in Your Flock?

The breeding stock is the foundation of the flock and in order to build up a flock that will have a high average egg production it is necessary to select the best birds in the flock for breeding purposes. The best results cannot be obtained by selecting eggs from those of the entire flock because a large number will necessarily be from the poorest producers and they will decrease instead of increase the average production. Therefore in order to improve the production, special breeding pens should be made containing only those birds which produce the greatest number of eggs. In order to succeed in increasing the production of the flock and to keep that production at the highest point, this plan must be followed year after year. It is a case of continuous and rigid selection.

In selecting birds for breeding purposes, not only is it necessary to consider large egg laying capacity, but it is also

and other fancy points, while not enough consideration is given to the vigor of the breeding stock. Egg production is a great strain upon the vitality of the hen and unless she possesses vigor to a great degree she can not stand up under this constant drain upon her system. Since lack of vigor in the parents is transmitted to the offspring, birds of low vitality must not be used as breeders. Success is possible only with strong, vigorous chicks and these can be obtained only by saving for hatching purposes the eggs of vigorous and mature breeding stock. Increased vigor means chicks which develop rapidly, less trouble from disease, more eggs, and consequently, more profit.

In selecting the females for the breeding pen, those individuals should be chosen which are high producers. Those selected should have laid a large proportion of their eggs during the winter, for it is at this season, when prices are high-

est, that eggs are most desired. The most accurate method by which to determine the egg laying record of a hen is by means of the trap-nest, but this involves considerable labor and is impracticable on the average farm. However, an accurate and practicable method of selecting the heavy producers is to place a leg band on the right shank of all those pullets which begin laying earliest; then during the last of September or the first of October of the following year, place a leg band on the right shank of all those hens which are still laying, i. e., which have pale shanks and have not yet molted. The hens with bands on both shanks are the heaviest producers and should be kept for breeding purposes.

Pullets should not be used for breeding purposes. Hens are best because they are more mature. They are more prepotent and will produce offspring with more vigor and of larger size when adults. Hens make the best breeders during their second and third laying seasons, but a good hen may be profitably kept for laying and breeding purposes for three or four years.

Those birds should be selected for breeding purposes which are off the roosts early in the morning and which are the last on the roost at night, for this indicates a good appetite, hence large capacity, and also shows vitality.

Having selected the hens which are the best producers and which are the most vigorous, the next requirement is to rest them for the three winter months. They should not be forced for winter egg production for their vitality will be reduced by forced feeding. Some poultrymen may claim that they cannot afford to rest their hens during this period of heavy production, but experience proves that resting breeding hens saves money in incubation losses alone, not to mention rearing losses. If the greatest vigor is to be maintained, the birds must be placed on free range in an open front house. They should be kept in good physical condition—thin rather than too fat. They may not lay much during the winter, but in the spring they will lay practically every day, and, moreover, practically every egg will hatch and every chick will live.

Since the male is half of the flock, in choosing males special attention should be given to selecting those which are strong and vigorous. An early hatched and well developed cockerel, or a vigorous yearling or two year old may be used. He should also be descended from high producers. In this way productivity will be inherited from both parents.

The male should be placed in the breeding pen a week or ten days before the eggs are saved for hatching in order to insure good fertility. The number of females to be placed with each male will depend upon the breed, a greater proportion of males being required with the heavy than with the light breeds. One Leghorn male with fifteen to twenty females will insure a high degree of fertility. With the American breeds—Plymouth Rocks, Wyandottes, and Rhode Island Reds—best results are obtained by using one male to 12 to 15 females, and with the Asiatic breeds—Brahmas, Cochins, and Langshans—one male to 8 to 10 females.

The hen must be bred to lay—she must inherit the capacity and ability to lay. By rigidly selecting breeding stock year after year for egg laying capacity and constitutional vigor, the average production of most flocks can be greatly increased.

“A farmer is a man who has no desire to become a millionaire. His trade is the most necessary and the least appreciated of all. He is the real backbone of the nation while the others are its lesser limbs, but very few of the others will admit it.”—Helen S. K. Wilcox.

The Boys' and Girls' Club Round-Up will be held at Purdue University May 3 to 7. The program will consist of judging and demonstration contests by club members, special demonstration exercises by the various departments of the school of agriculture, special exercises by the boys and girls under the direction of the Purdue military and athletic departments, exercises and contests in co-operation with the Purdue Egg Show, and other interesting and helpful features.

Common Ailments of a Cream Check

By E. H. Leindecker,
Assistant in Dairying.

WHATEVER might have been said about the honesty and reliability of creamerymen in past years it is generally recognized today that the majority of creameries are being run in an honest and businesslike manner. This change has been due to several reasons.

or using illegal glassware is prosecuted and often times punished by a fine and by having his business closed.

All the work in the creamery itself which has to do with the weighing sampling and testing of cream, the figuring and writing of the amount of the check, is done by hired help, who receive a



A check on tired muscles—use your watch or a correct speed indicator.

Checks on Dishonesty.

The development of accurate tests and systematizing of factory operations have enabled the butter manufacturer to know exactly where he is losing money or making a profit and consequently he eliminates any unprofitable enterprises. It is not necessary for him to cheat or defraud to make a profit. Strong competition in cream buying has caused a lot of creamerymen to adopt the correct test policy because with 3 to 8 cream stations in nearly every town the man who under tests soon loses his patrons and closes up shop. He cannot exist among honest business men because the average farmer is too shrewd to be deliberately cheated.

Creamery inspection has also helped greatly in securing for the farmer the correct and proper payment for his cream. Four inspectors are constantly traveling the state of Indiana checking up on cream stations and creameries. They inspect all glassware, weights, and scales to see that they are accurate and anyone found under-testing, over-testing

stated wage each week, which is in no way dependent upon the amount of cream weighed or tests made. If the test for any one can of cream varies over two to three per cent from the last test it is usually re-tested to avoid any mistakes.

Regardless of all these checks upon the attempted dishonesty of any creamery there are still a large number of farmers who look with suspicion and discredit upon anybody in the cream buying business. Any drop in a cream test, whether large or small, immediately calls for a strong denunciation of the creamery buying the cream. The prevalent opinion is that the fault always lies with the creamery when in reality the factors effecting a variation in the cream test under the control of the producer greatly outnumber those under control of the creameryman.

Farm Factors Effecting Test.

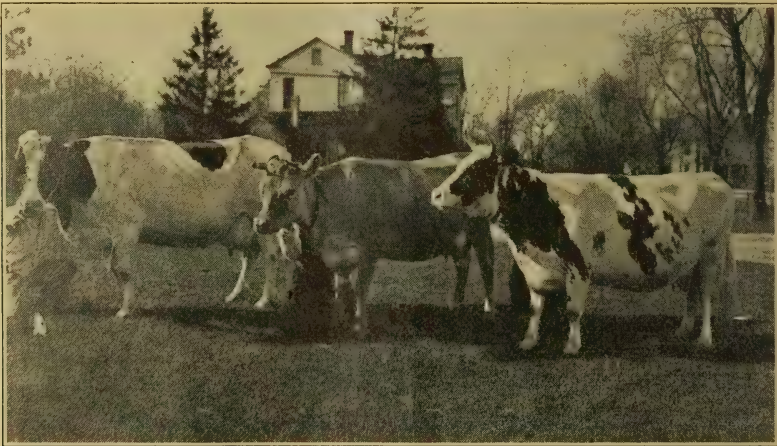
The numerous factors relating to the farm which may effect the test of the cream are briefly set forth in the following paragraphs:

1. Rich milk gives higher testing cream than thin milk. For instance 3 per cent milk gave 20 per cent cream and 4.5 per cent milk gave 32.5 per cent cream, using the same separator and having all other conditions the same. Therefore any factor effecting the test of the milk such as; high testing cows drying up; low testing cows coming fresh, new cows being added to the herd, changes of feed which effect flow and test of milk, or sudden excitement of cows causing them to hold up their milk, principally rich strippings, will change the test of the cream.

5. The temperature of separation should be from 90° to 95°F. Any temperature below this will result in a higher testing cream and a greater loss of butter fat in the skim milk.

6. When flushing the bowl with skim milk or water use the same amount every day. The use of varying amounts will cause a varying test of the separated cream.

7. The cream that is sent to the creamery should be as smooth as possible. The formation of lumps of curd or butterfat make it practically impossible to secure a representative sample



Some fundamental reasons why cream tests vary. The richer the milk the richer the cream.

2. It is a common knowledge that a change in the cream screw will change the test.

3. The rate of inflow of milk to the separator changes its tests materially. A small inflow on a separator gave cream testing as high as 70 per cent, while cream from a large inflow of milk tested 32 per cent in comparison to 44 per cent cream obtained with a normal inflow, the result of using the float. You cannot afford to run your separator without a float.

4. Turning a separator at slow speed instead of the normal speed resulted in a difference of 21.4 per cent in the cream test and a loss of 1.07 lbs. of butter fat in the skim milk for every 50 lbs. of milk separated. Time the speed of the separator crank while turning it to secure uniform tests and efficient skimming.

and the test may be either higher or lower than its true test.

Balancing the factors which may result in a varying test due to the faults of the creamery with those factors which the farmer has under his control, we find that there are many more chances for the farmer to be at fault than the creameryman.

Correct Interpretation of the Cream Statement.

There are other more important figures upon the cream statement than the test and the amount of the check. The number of pounds of cream and the pounds of fat for instance are far more important than any test which might appear on the statement, when it comes to getting a clear and true comparison of each week's returns with the last. A

(Continued on page 362)

Farm Cost Accounts

By Lynn Robertson,

State Leader Farm Management Demonstration.

(This is the second of three articles by Mr. Robertson on Farm Accounting Published Monthly in the Agriculturist).

ONLY a very small percentage of the farmers who keep records have a system of accounts that shows the costs and profits for each separate enterprise such as corn, oats, hogs, cattle, etc. A record of the farm receipts and expenses with inventories gives all the information necessary to figure the income from the farm as a whole and requires as much attention as most farmers care to give.

However, an increasing number of farmers, especially those who have had experience with the simpler records, are feeling that they can to advantage, keep more complete accounts that will show the results from each separate enterprise as well as the entire farm business. These more complete accounts offer, of course, much greater possibilities of usefulness in studying the farm business than do the simpler farm accounts and their popularity will doubtless grow as they become more generally understood.

In spite of the popular demand for figures showing the actual cost of production, the main value of cost accounts is not that they show cost in actual dollars and cents, but rather that they offer opportunities of studying the enterprise to increase its profits. The simple farm record shows in a general way the weaknesses in a farm business. The cost account record of the separate enterprises helps to show the reason for the weakness and indicates how it may be overcome. For example, the general farm record may show that the farmer is getting poor returns from feed fed to livestock; the enterprise cost records then help to determine whether the fault is in quality of livestock, method of feeding and management, market facilities or some other condition.

The first step in advance from the simple financial record of the farm as a whole is a record of the additional information necessary to figure the cost of

some one important enterprise in the farm business. This requires in addition to the record of the actual cash transactions, a record of other charges and credits such as man and horse work done on the crop or livestock considered, feed fed, shelter and equipment used, etc. Blanks for keeping these single enterprise accounts are available from the Extension Departments of most of the State Agricultural Colleges.

What is practically the final step in farm record keeping is the complete cost accounting system for the entire farm business. Such a system shows the profits from the entire farm and the separate contribution of each crop and class of livestock.

A satisfactory book in which to keep complete cost accounts is an ordinary day-book. Usually four classes of records are kept, inventories, cash records, feed records and labor records.

For the cash records a double page is headed for each enterprise on the farm including each drop and class of livestock and also equipment, real estate, man labor, bills receivable and bills payable. On these pages the cash transactions are put down as they occur during the year and also transfers are shown of material from one enterprise to another. It is on these pages that the final enterprise summaries are made.

Two methods of keeping the labor records share in popularity. Pages may be headed with the same headings as the cash record and the man hours and horse hours shown in the money columns to the right. In this method the kind of work is indicated in the broad "item" columns. A simpler labor record, but one which does not show the kind of work may be kept by ruling a double page for as many columns as there are enterprises and heading each column with the enterprise named, using one of the double pages each month.

Feed fed is kept track of in various ways. Frequently a part of the book is set aside for monthly records of feed, manure hauled, farm products consumed in the house and an estimate of board furnished the labor. It is not necessary to keep track of feed fed each day to any class of stock. As long as the same amount of feed is being fed daily, a lump entry can be made every week, two weeks or even once a month. If only one kind of stock is being fed from a feed supply, a simple way to keep track of the feed is to charge the whole supply to that class of stock rather than to keep track of the daily feeds. At the end of the year the feed, labor, machin-

ery and other costs as well as the inventories are transferred to the various enterprises in the cash column and the summary made there.

Complete cost accounts may also be kept by the "diary" method. A large enough book is necessary so that a page may be used for each day. The cash transactions, labor records, etc., and any farm information interesting for future reference is recorded on that page. Such a record is very interesting as a reference and gives all the material necessary for figuring the enterprise profits, is perhaps easier to keep from day to day, but requires a great deal more work in summarizing.

Pinney Purdue Farm

By H. J. Reed.

Prompted by unselfish desires to serve agriculture and country life of northern Indiana in a permanent and effective manner, Mr. William E. Pinney, of Valparaiso and his daughter, Mrs. Myra F. P. Clark, generously donated to Purdue University the Pinney Purdue farm of 400 acres, situated in Porter and Laporte counties and the Pinney Purdue soil experiment field located about a mile and a half east of Wanatah in Laporte county. In addition to this Mr. Pinney gave with his farm his undivided interest in the live stock after making certain reservations for the farms.

The farm is well equipped with buildings, consisting of a beautiful residence which is the homestead of Mr. Pinney, cattle and sheep feeding barn, large dairy barn, milk house, implement shed, hog barn, and the other necessary buildings found on a farm of this size.

There are four types of soil in the farm: Muck, Maumee loam, Plainfield sandy loam, Plainfield fine sand.

The farm is primarily a grain and livestock farm and every effort will be made to incorporate the best knowledge in the management of the farm that can be developed from its extensive experiments in the problems of soil fertility and crop production, livestock production, herd development, etc. At the present time there is a good herd of pure

bred Duroc hogs headed by a young boar, "Purdue's King Orion." There is also a pure bred herd of Red Polled cows which will be developed into an accredited Red Polled herd. Mr. Pinney believes in the Red Polled cows as a farmers' cow and much effort will be made to improve and develop this herd.

Mr. George S. Wann was the local manager when the farm was received in March, 1919, and was retained in that capacity.

Considerable new equipment has been added during the past season and work has been started which will enable us to attack the various problems of agriculture so that the farm may be the source of sound information on agricultural practices and good stock. In this way it may be a continuous and ever increasing service to agriculture and country life and a fitting contribution to the perpetuation of the ideals of Mr. Pinney and his daughter.

JUDGING CONTESTS START IN INDIANA.

Contests have been started in a number of counties over the state to select the team that will represent the respective counties in the livestock, corn, egg, dairy cattle, sewing or bread judging contests at the boys' and girls' club round-up May 3 to 7.

How to Calculate the Values of Bordeaux Mixture

A. M. Nichter, '20.

AS a result of the present high prices of copper sulphate, many farmers who are compelled to combat such diseases as bitter rot and blotch of the apple, black-rot of the grape, and late-blight of the potato, are asking the question, "What can we use in place of Bordeaux, to control these diseases?" As an answer to this question it can be said that so far as it is known at present, the above mentioned diseases can be controlled satisfactorily only by Bordeaux mixture or some other preparation containing copper in some form as the principle active ingredient.

As a rule the grower expresses the strength of his home-made Bordeaux mixture in terms of the crystallized copper sulphate (CuSO_4) and of the lime that go to make up 50 gallons of prepared spray. Thus the formula 4-4-50 is taken to mean that 4 pounds of crystallized copper sulphate and 4 pounds of lime are used to make up 50 gallons of the preparation. According to the insecticide act of 1910, manufacturers are required to give a statement of the percentage amounts of each and every ingredient of his insecticides or fungicides having insecticidal or fungicidal properties, and to state the total percentage of insect ingredients present. Therefore on every label of commercial Bordeaux mixtures, the copper content is expressed in terms of percentage. This percentage is usually given in terms of copper (cu), and in order to be changed to terms of crystallized copper sulphate (CuSO_4), it should be multiplied by the factor 3.93 furnished by Mr. C. C. McDonnell, of the Bureau of Chemistry. If the manufacturer has the copper content in terms of copper oxide (cuo) it should be multiplied by 3.14, or if he has stated it in terms of copper hydroxide (Cu(OH)_2) multiply the percentage by 2.56 to get the equivalent percentage of copper expressed in terms of copper sulphate. Furthermore if it is desired to calculate the copper sulphate in the mixture when diluted ready for use, multiply the percentage of copper sulphate

of the concentrated mixture by the number of pounds of concentrated mixture used to each 50 gallons of water.

After the grower has calculated the amount of copper sulphate in the commercial Bordeaux mixture when diluted, he can then compute the money value of the ingredients of the commercial mixture as compared with the home-made preparation of the same strength. He can thus largely determine which is the more expensive,—the commercial Bordeaux mixture or the home-made preparation.

However, to determine whether the commercial or the home-made mixture is the cheaper, there are other factors to consider besides the money value of the ingredients. An allowance must be made for the cost of handling and preparing of the home-made preparation. The cost of equipment and labor will vary with the individual and with varying circumstances. Furthermore the kind of labor available is of considerable importance. If one must employ incompetent or unreliable help to prepare the home-made mixture, the chances for mistakes are greater than in the case of a preparation manufactured by some reliable company. In such cases it may be advisable to not even consider the problem of home-making.

Another factor to consider in determining the real value or efficiency of Bordeaux mixture is the physical properties of the preparation. A preparation that is coarse and granular in texture, with poor spreading and sticking qualities, can not be expected to give good results in cases where a good fungicide is needed. There is a considerable variation among the commercial preparations as to just how long they remain in suspension, but it has been found that, as a general rule, fresh home-made mixtures remain in suspension much better than any of them. So in general, it is believed that the rate of subsidence is a fairly good criterion by which to judge the physical properties of Bordeaux mix-

(Continued on page 366)

THE PURDUE AGRICULTURIST

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

Smut Treatment.

Did you treat your oats last spring? If you did, you will of course do so again this spring, because of the fact that your crop yield was increased. But if you did not treat your oats last spring you had better do so this spring. The extra yield that you will get will more than pay by far the trouble and material necessary to treat them. Besides you will not be feeding smutted oats to your horses. A good formula for the treatment is to mix one pint of formaldehyde with one pint of water and use in a small hand sprayer. Spread the oats on the floor and spray the solution on the grain as it is shoveled, taking care that the mist is well distributed. One quart of the solution should treat fifty bushels of grain. When all the grain is treated shovel into a pile and cover with some sacks, bags or old cloth for five hours. The grain may then be sown or allowed to air dry thoroughly and stored in disinfected bins or sacks until needed. While you are buying the formaldehyde you may as well buy enough so that you can treat your seed potatoes for scab. Take a barrel or tub and put in it a solution of one pint of formaldehyde to thirty gallons of water. Put about one-half bushel of potatoes in a sack, place in the barrel or tub containing the solution, leaving it for one-half hour. At

the end of that time take the sack out, and let the potatoes dry, then store them in a disinfected bin or sack unless they are to be planted shortly. The potatoes should be treated before being cut for planting. Try these simple treatments and we feel sure that you will be well paid for your time and trouble.

RAISE IN SUBSCRIPTION PRICE.

We feel that very few of our subscribers will be surprised to know that the price of the Agriculturist will be \$1.00 after March 15. Other similar publications have sold for \$1.00 for several years, but we have not raised until we found it absolutely necessary. Since the beginning of the war we have been confronted with two 30 per cent increases in printing charges and sharp advances in cost of stocks. We were recently notified that printing with be 30 to 35 per cent higher again next year and are forced to raise our subscription price. We earnestly desire your continued patronage and hope that the Agriculturist will continue to bring you the latest news from the College of Agriculture and the Experiment Station. All renewals and new subscriptions will be fifty cents until March 15 and after that time one dollar. Send subscriptions to the Circulation Manager, Purdue Agriculturist, West Lafayette, Ind.

THE UNIVERSITY AN INSTITUTION OF SERVICE.

Purdue University like every other similar state university, was founded to be of service to the people of the State in which it is located. In years gone by Purdue has always been able to meet her obligations to the people of Indiana, though in many cases she has been hard pressed financially to do so. The leaders of the University were persistent in their efforts and always made the most of the finances at their disposal.

The time has arrived when there must necessarily be a change. We know that the dollar of today is worth at most not more than sixty cents when compared to the dollar of a few years ago. A dollar that is spent by the University purchases no more than the dollar that you or I spend. It costs us practically twice as much to live today as it did five years ago. Does it follow that Purdue can deliver the greatest amount of service to the people of Indiana on the same income that she received years ago?

The various departments have no more money to carry on their work than they had ten years ago. The University is constantly losing good men because they are underpaid, and see no prospect for better salaries or for funds with which to provide for development in their departments. The organization of a faculty which has had few, if any peers in the country, will soon begin to disintegrate unless funds are provided to furnish deserved compensation for their services.

What will be the result? With the best men gone to other institutions or into the commercial game their places will be filled with second rate faculty. That will mean that Purdue must drop to the place of a second rate institution. Do the farmers of Indiana want to send their sons to a second rate University and have them taught by second rate men or do they want them instructed in a first rate University by the best men in the land? Many big problems confront the people of the state now, but there is none any more vital than the question of greater appropriations for Purdue.

The people of New York heard the same thing about Cornell and determined to investigate. Eighteen committees, numbering 109 farmers and home makers and representing all the leading agricultural associations in the state have visited the college at their own expense. They have studied its work, its classrooms, its laboratories and equipment, its budget and salary lists. Their eyes have been opened to conditions that they did not dream existed and they are taking active steps to give Cornell what it need. If Indiana farmers will acquaint themselves with actual conditions at Purdue similar action will be taken in Indiana.

Incubation.

We all know that the early hatched chick will be the best layer in the fall and winter. To get early chicks we usually resort to an incubator. You will increase your hatch considerably if the following care is taken with the incubator, providing the eggs are fertile:

1. A temperature of 101-102-103 degrees, the first, second and third weeks respectively, using a standing thermometer on a level with the top of the eggs, but not touching them, will prove very satisfactory.

2. A temperature of 103-104-105 degrees is too high and will injure the hatch.

3. The incubator should be regulated before eggs are put into it.

4. All temperatures should be read two or three times a day and recorded morning, noon and evening.

5. The lamps should be filled in the evening after all the recording has been done, regulators adjusted and eggs handled.

6. The incubator doors should not be opened for forty-eight hours after the eggs have been put in.

7. Eggs should be turned morning and evening, from the second to the eighteenth day.

8. The moisture should be supplied in sand trays is provided with the machine, or water in pans placed about the room or sprinkled on the floor.

9. Beginning on the eighth day, the eggs should be cooled once a day until they feel cool to the eye lid.

10. The eggs should be tested on the seventh day for infertile eggs and dead germ, and on the fourteenth day for dead germs.

11. On the eighteenth day the incubator should be closed and not opened except to remove the sand tray when the chicks commence to hatch. The incubator should not be opened again until the hatch is finished.

12. The egg trays should be removed at the end of the twenty-first day. Records may be kept of time of turning, amount of cooling, fertility, number of dead germs, time of hatching or other small details.

INDIANAPOLIS POULTRY SHOW.

The annual Indianapolis Poultry Show, held February 4-8, proved better in quality and larger in number of entries than ever before. Breeders from Indiana and many other states took part in this display of finely feathered specimens.

Indiana has long been famous for her standard-bred poultry. This reputation has been largely made by such breeders as the Fishels, Hewes, Holterman, Keeler, Tormohlen, Demberger, Pape, Byers, Barker, and numerous others. From the winnings which Hoosier breeders have made at Indianapolis and other large shows this season, it is agreed that Indiana continues to live up to past records.

Purdue Exhibit.

In co-operation with Secretary Theo. Hewes, the Poultry Division of the Extension Department staged an educational exhibit in charge of C. W. Carrick. An up-to-date poultry house, built after the plan of the new breeding houses at Purdue, was the outstanding feature of the exhibit. The house was equipped with roosting closet, self-feeder, water stand and sanitary wall nests. A flock of White Plymouth Rocks, loaned by U. R. Fishel, of Hope, gave an added attraction to the poultry house. Methods of telling good layers from poor layers were demonstrated, using live birds showing these characteristics.

The Indiana State Poultry Association had their headquarters next to the Pur-

due exhibit, President U. S. Fishel and Secretary L. L. Jones being in charge.

Much credit is due Secretary Hewes for the manner in which he is placing the Indianapolis show on a par with the best poultry shows in America. Undoubtedly his efforts are accomplishing much to weld together the fancy, utility, educational, and commercial poultry interests. Such an enterprise deserves the heartiest support of the entire industry.

SPIRIT.

Here on the campus of the University, one is well aware that there is a strong feeling of friendly rivalry between the students of the School of Agriculture and the students of the various Schools of Engineering. There is no objection to this ever present rivalry which, when molded together at an athletic contest forms what is commonly called "school spirit." However, "spirit" is something which should not be limited to the enthusiasm of a foot-ball or basket-ball game. Because you are an "ag" do not knock the Engineering School and vice versa for "knocking is a sure way to put the skids under your prospects."

Graduation wipes out this petty school rivalry and live alumni unite to boost their Alma Mater regardless of the course which they pursued while in the University. But why wait until you are an alumnus? Learn the good points of your university now, and miss no chances to stick in a good word for Purdue. For all who are interested in a bigger and better University we print the following creed. Part of it is adopted from the Exponent and part is our own:

1. Student Union building by 1921.
2. Clean politics.
3. Purdue at top of Conference athletics by 1921.
4. Greater co-operation between alumni, students and faculty in bringing athletes to Purdue.
5. A new building to take the place of Purdue and University halls for recreation and registration purposes.
6. A Convocation fund.
7. A new Womans' building.
8. An up-to-date athletic field.
9. Funds to secure and hold for the faculty the best men in the country.
10. An everlasting boosting spirit.

Growing Sugar Beets in Indiana

By W. E. Leer, '19,
Assistant in Crops.

(Note—A continuation of the article appearing in the February issue under the same heading.)

ONE of the most serious problems that confront the farmers today is the question of labor, and this is especially true of the sugar beet grower since he requires more than the usual amount of help in caring for his sugar beet crop. The labor required in producing sugar beets can be divided into three classes—growers', horse and contract. The amount of labor necessary for the grower to perform will, of course, depend upon how well he utilizes his horse labor and how much contract labor he is able to use. The contract labor takes care of the blocking and thinning, the hoeing and the pulling, topping and piling. This labor is arranged for by the field men, who are hired by the beet sugar company, and a contract price is paid these laborers by the growers. They are under the supervision of the field man and in this way much detail work is handled by these men. With the proper co-operation between the field men and the growers the contract labor proposition becomes only a minor factor in sugar beet production. However, on the other hand, unless the growers and the field men are able to co-operate this question becomes a limiting factor in sugar beet production. The cost of contract labor is usually relatively cheap as compared with the cost of other labor hired on the farm. The basis for hiring this labor depends upon local conditions, however the basis of the contract, in Indiana, is at a given rate per acre for each of the operations performed. In order to best utilize the horse labor on the farm, it is necessary to use implements which perform the work on a "big scale," as four-rowed cultivators, four-rowed seeding drills, two-horse lifters, and using machinery which will do away with hand labor whenever possible. With the proper use of horse labor, and contract labor, it is no more trouble to grow sugar beets than it is to grow corn or any other farm crop.

Cost of Production.

Along with the continually increasing high prices of the necessities of life, and the high price of land, the cost of growing sugar beets has been increasing at a similar rate. The labor necessary to produce an acre of sugar beets amounts to about 60 per cent. of the total cost of production. In Indiana the total cost of production ranges from \$3 to \$12 per ton, depending upon yields and economic practices in production. The average cost is about \$4.50 per ton and from \$40 to \$60 per acre, with an average of \$50 per acre.

Value of Sugar Beets.

The prices received for sugar beets by the grower have been inflated along with other inflated prices during the last few years. In Indiana the price has ranged from over \$9 to nearly \$12 per ton for the beets, and yields has been reported from five tons or less per acre to over thirty tons per acre. Net profits have ranged from a negative profit or a loss to over \$200 per acre. It is impossible to say how much profit might be had from a crop of sugar beets, but generally speaking they have been a paying crop where they have been grown for the past few years. Like all other crops, a failure will come some years and other years a bumper crop will be harvested.

Sugar Beets Not Injurious to Soil.

Mr. C. O. Townsend, pathologist in charge of Sugar Beet Investigations, Bureau of Plant Industry, Washington, D. C., makes the following statement:

"The theory that sugar beets will ruin the land has long since been exploded. The best crops of sugar beets and other farm products are found on many of the farms where sugar beets have been grown longest. This is in part due to the fact that good farmers have become better farmers through their experience in growing sugar beets. Proper rotation of crops, good cultivation, generous applica-

tion of barnyard manure, and the judicious use of commercial fertilizers are the factors that keep the land in good condition and enable farmers to obtain the highest possible return for the labor and money invested. The situation in regard to land values, so far as they relate to sugar beets, may be stated as follows: Inasmuch as sugar beets require the best quality of soil and demand that it shall be in the highest state of cultivation to produce best results, sugar beets must remain a comparatively high-priced crop and any attempt to reduce

is sold off the farm, in one form or another, you should purchase feeds to be fed to live stock on the farm so that as much fertility is returned as was sold. Not all crops can be fed on the farm—beets is one of these crops. When beets are sold from the farm it is a good practice to purchase corn and clover hay in order to return the same elements of fertility as were sold in the beets. Fifty bushels of corn and two tons of clover hay fed to cattle and the manure returned to the soil will replace more fertility than is sold in ten tons of sugar



An Indiana Sugar Beet Field. 9000 acres of such beets were grown in Indiana last year.

their price must result either in producing an unsatisfactory crop or eliminating sugar beets from the system of crop rotation in many localities."

No doubt Mr. Townsend hit the keynote when he suggested the liberal use of barnyard manure. Only too often beet growers are guilty of selling the crop of beets, then depositing the money in the bank or spending it for some needed improvement about the farm and forgetting all about the necessity of returning fertility to the soil equal to, if not greater in amount, than that which was sold in the beets. Any crop will run down the soil if it is sold off the farm and no fertility returned through barnyard manure. The keynote to the maintenance of soil fertility is to either feed all crops grown on the farm to live stock and the manure returned to the soil or whenever fertility

beets. By the judicious purchasing of feeding materials, the soil can be kept in a high state of fertility.

The Future of the Sugar Beet Industry.

The future of the sugar beet industry in Indiana is exceedingly bright. With the ideal conditions as prevail in the greater part of the state for sugar beet production, with the establishment of beet sugar factories in this section of the country, the possibilities for the new industry are great. There is at the present time, and will probably be for some time, a shortage in sugar. There is no immediate danger of overproduction in the sugar industry. The new methods of beet sugar manufacturing have made it possible to put on the market a product equal in every respect to the sugar made from cane. The best chemists are unable to

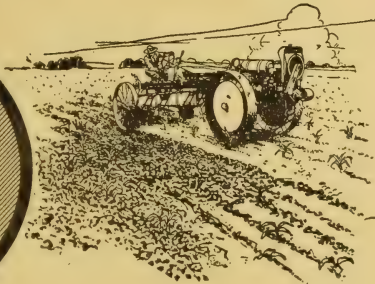
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| 4. A single unit of operation—the tractor and implements form but one unit | | <i>Means</i> | Can back and turn short |
| 5. Operator sees all his work—"Foresight is better than hind sight" | { | <i>Means</i> | Better and faster work |
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The Possibilities of the Orchard Business in Southern Indiana

THE possibilities of the orchard business in the southern part of Indiana are realized by only a few of our farmers. We have the available land, which will produce fruit, with the color and flavor, if given attention, as is shown by the number of premiums our apple growers in Knox and Daviess counties take each year at the Indiana State Apple Show.

We have in our midst one of the best paying apple orchards in the State of Indiana, and perhaps in the United States. It belongs to Allen Harbin, and is located 2 miles from Wheatland, Ind., 7 miles from Washington, 14 miles from Vincennes, and 7 miles from Bicknell, Ind. Mr. Harbin was not an experienced orchard man when he took this orchard over, some six years ago, but he observed from careful study the possibilities of this orchard, if given good care and attention. Part of this orchard was 40 years old, and part of it 22 years old, there being 8 acres of it, set with the Old Fashioned Winesaps and Mammoth Black Twig. The orchard had never been cared for, but was just allowed to grow. It had never been pruned or sprayed; so Mr. Harbin started by first cleaning it up, then pruning and spraying it. He cared for it according to the instructions of the Purdue Bulletins, together with the hints and advice he could get from practical orchard men. Today he has a well cared for orchard, and one that is perhaps making him more clear money than any other orchard of its size in the State of Indiana. This year he sold his apple crop for \$8,000.00, and his cost of pruning, spraying, spray materials, plowing, discing and the harvesting the crop was \$2,400.00, leaving him a net profit of \$5,600.00 on 8 acres, or \$700.00 per acre. What other crop will bring a net profit of anything like this?

Three years ago Mr. Harbin had a good crop of apples, but the price was not quite so high, yet his net profits per acre were \$450.00. Last year the crop

was small, but he had a nice profit left, after all his expenses were paid.

Mr. Harbin is an apple grower that does not believe in doing things by halves; so three years ago he decided that in order to get the best results from spraying it would be necessary for him to get a power sprayer. He purchased one from the Bean Spray Pump Co., and has sprayed his orchard six or seven times each year since getting this spray pump, and his apples certainly show the effects of good spraying, for they are 90 per cent. free from worms or disease. First, Mr. Harbin sprays in the fall for the scale after the leaves have dropped off and the trees are in the dormant stage with a very strong solution of lime-sulphur. The next spray is for the scab and green aphids, applied just as the buds begin to turn pink; for this spray he uses lime-sulphur, arsenate of lead and Black Leaf 40; next he sprays after the petals fall with the lime-sulphur and arsenate of lead to control the codling moth, late scab and curculio. In years favorable for scab infection he puts on a follow-up spray ten days later using lime-sulphur, arsenate of lead. The fourth summer spray is three weeks after the petals fall to control the blotch. This spray is repeated five weeks after the petals fall. The last spray is usually ten weeks after the petals fall for the second brood of codling moth.

Mr. Harbin plows his orchard to the depth of 4 to 6 inches, and double discs it both ways, and harrows it twice; then he sows it in red clover, thus keeping as much moisture in the ground as possible.

The appearance of his orchard in the spring reminds one of a well prepared garden.

Two years ago Mr. Harbin put three tons of limestone per acre on this orchard, and last year he used 300 pounds of nitrate of soda per acre. This together with what barnyard manure is produced on the place is the fertilizer

(Continued on page 368)

Oliver

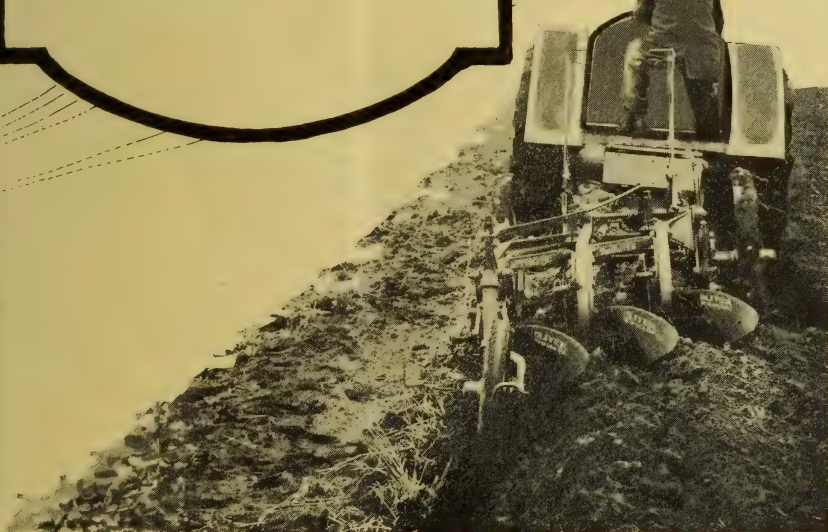
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Essential Factors in Rural Leadership

By C. R. Hoffer.

Department of Rural Sociology, Iowa State College.

SOME months ago the following statement appeared in one of our farm papers: "Leadership is more important than equipment." Whether knowingly or not, the author of the statement voiced a truth that is of increasing importance to the rural community and farmer today. A casual survey of the ordinary community will reveal this fact.

the leader of an average community possesses characteristics which are not common of the rank and file of farm folk or are undeveloped.

There are only two ways through which the community may secure adequate leadership: First, by developing the latent talent of the resident members; or secondly, by securing, through importation, the services of a trained



Rural leadership being discussed by a practical agriculturist at the farmers picnic.

It is not an uncommon sight to see the consolidated school standing idle during the summer vacation and in the winter ministering to the farmer and certain members of his family only in an indirect way. Many rural churches are either abandoned or are doing inadequate work. The social and sometimes the financial agencies of the community are undeveloped because there is no one to point out the way. No one to lead the people.

This condition indicates that the demand for trained leaders greatly exceeds the available number. Obviously then,

leader who is ordinarily associated with the school, church or other organized agency. At the present time the tendency is favoring the latter method, but it is the writer's humble opinion that sufficient leadership should ultimately come from the community itself. However, many leaders are now going into rural fields. The characteristics for leadership which these people possess will determine not only their success, but the attitude of the people toward community betterment. A clearer conception of those factors, therefore, which are essential for good leadership should

result in better workers and a greater spirit of co-operation on part of the community.

A good leader must know not only the fundamentals of agriculture, but in addition he must know the place of agriculture in the industrial world today. In a like manner, he should know the social status of people who follow agricultural pursuits. He should know farmers and their problems in a way that will enable him to meet them on common ground. Superficial knowledge and acquaintanceship can not last or bring beneficial re-

leader who possessed an unusual amount of knowledge and skill, but failed to reach the people of the community simply because he could not adapt himself to local conditions. He could not be one among them. The leader must remember that community habits and customs are the result of generations of training and selection and that a change must come gradually.

Closely allied with the quality of adaptability is that peculiar, yet invaluable, factor known as tact. Webster defines the term as "the ready power of ap-



A community enjoying a baseball game on Saturday afternoon, a result of rural leadership.

sults. The relation between the leader and farmers should be that sort which comes from a heart to heart sympathy in the development and improvement of agriculture.

Furthermore, a leader will necessarily need to understand the particular field in which he is working. Communities differ. Each one has its likes and dislikes, its commendable features and its objectionable features. A program that will succeed in one place may meet with utter failure in another. We can hope for success only with a program that is planned with due consideration of the habits, customs, and tendencies of the particular community.

The leader must possess the quality of adaptability. No one can succeed in working with the people unless he adapts himself to the surrounding conditions. The author has in mind a

precipating and doing what is required by circumstances." When we consider how varied human nature is and the innumerable circumstances in which the leader is placed, we appreciate the importance of this attribute. There are many instances in rural organization work when tact has saved the day in important situations. Rural people, by virtue of their occupation and method of living, are rather conservative and take up with new ideas slowly. Nothing can replace tact in getting a ready response.

The leader must be industrious. Every minister, teacher, or farmer who has taken an active part in developing the life of his community is cognizant of this fact. It takes work to organize a program and then more work to carry it to a successful conclusion. If the rural leader works only until he feels he has

(Continued on page 370)

Prevalence and Control of Cabbage Yellows

By R. V. Allison, '20.

THROUGHOUT the state last season, and for many seasons past, many districts were observed to be quite heavily infested with cabbage yellows, and in almost any part of the state this important disease could be found quite consistently in patches or fields where cabbage had been raised more or less continuously. The nature of the disease is shown somewhat by the attempts at remedial measures of those not acquainted with its pathological nature. For when it first appears in the plant, quite invariably, the appearance of the plant at this time leads the gardener to believe that there is a deficiency of some important element of food in the soil, and immediately he gives the soil an elaborate treatment of manure, wood ashes, or artificial fertilizer in an attempt to supply the imaginary want, whatever it may be. In other cases, where the disease is first noted to appear to any serious extent after such applications are made, the reverse of the theory is found to appear, and instead of being a cure for the condition, the application is thought to be the cause of it. As a matter of fact, neither the application or the lack of it has any direct bearing whatsoever upon this particular disease, though infection may be carried in manure containing diseased cabbage refuse.

The Disease.

Although cabbage yellows has been known in this country for nearly two decades, its very rapid development during the last few years has been such as to give it place among the most important of the diseases affecting economic plants. That it is not a soil deficiency, but rather a "soil sickness" or infestation (a soil fungus—*Fusarium conglutinans*) that is the source of the trouble is indicated by the fact that upon the soil where cabbage or any other crucifers are totally unable to develop to maturity, luxuriant crops of any other type of plant can be readily grown. The *Fusarium* is known to attack the roots of the plant, either in the seed-bed or shortly after transplanting, and it is at this time that

the character of dwarfishness and yellowing first begin to appear. Sometimes the infection occurs only locally in the plant, and in such instances the unequal development which follows results in a warping and distortion of the plant structure from its natural position.

Though the trouble is thought to first begin with the invasion of the fibrous roots of the plant, the disease can be detected quite early in its development by making a cross section of the stem and noting the brownish or blackish spots arranged in a ring directly beneath the epidermis. Due to the invasion of the leaves by the fungus, the leaves thus infested begin to drop, and since the lower ones are the first invaded, these are the first to yellow and fall, and for this reason, in this disease, the long bare stump with the small bunch of green leaves at the top has come to be accepted as an almost invariable symptom of the disease. Rarely in the common strains of cabbage are the infected plants even able to form heads, as many of them die within a week or ten days, though others may perhaps struggle along for a month or six weeks, or perhaps through the entire season.

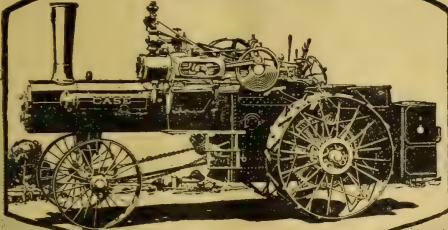
Control.

Since the source of the disease has been carefully traced to a definite fungus capable of living in the soil for four or five years in the absence of the host plant, it is readily seen that only two practical ways are open in combating actively infested areas, first—crop rotation, and second—use of disease resistant stock, for, as yet, no method of soil treatment has been found to destroy the fungus that would be possible or practical—especially on a large scale. In the use of the first, it will simply be necessary to keep all crucifers off the land for the time mentioned, while in the second, if the resistance of the plant be sufficiently strong, no attention need be paid to the presence of the organism in the soil.

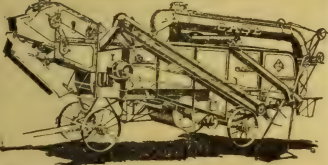
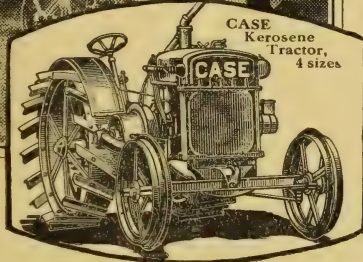
Selection of Resistant Plants.

The selection and development of resistant varieties of cabbage against this

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disease, as in the case of many other plant diseases, is coming to be recognized as the most practical and economical method of eliminating the danger of their presence. It should be remembered, too, that disease resistant varieties are a most valuable means of general control, for, though the disease is not actively apparent, it should be worth the extra cost to the grower to know that he is immune to the many conditions which may give opportunity for a sudden appearance or rejuvenation of the disease. In his report to the Indiana Station of the Cabbage Yellows Conference held at Racine, Wis., last fall, Dr. M. W. Gardner states that best results are obtained by making the first selection from fields that are about 90 per cent. infected, and that subsequent infection of these selected strains are very soon reduced to 10 to 15 per cent.

Resistant Varieties.

The two principal kraut varieties that have been given special attention at the present time are "All Season" and "Brunswick," and according to the report of J. C. Walker on January 28th at Cleveland, O., Wisconsin "All Season" will be available for 1921 planting and Wisconsin "Brunswick" for 1922. The seeds of both

are in the hands of the Kraut Growers' Association for distribution. Resistant seed of the Wisconsin "Hollander" may be obtained at any time by applying to the Agricultural Experiment Station, Madison, Wis., or to W. A. Orton, United States Department of Agriculture, Washington, D. C. In the east, Maryland has developed a resistant "Flat Dutch" type, while the resistant "Hollander" along with "All Season" are grown extensively in the west. Though Iowa is developing a resistant strain of "Copenhagen," it is uncertain just when it will be available. Its final perfection will, without doubt, be much appreciated by the market gardeners in the region of Indianapolis as would the same for "Jersey and Charleston Wakefield," for, though they have qualities which tend to reduce their susceptibility, the experience of many growers through the past season has shown that dependence upon seasonal habits of the different varieties for protection is not a wise policy or practice. Dr. Gardner reports that it is quite possible to give almost any commercial strain a relatively high resistance by the methods outlined, but points out that such selections should be made in the district where the seeds are to be sown.

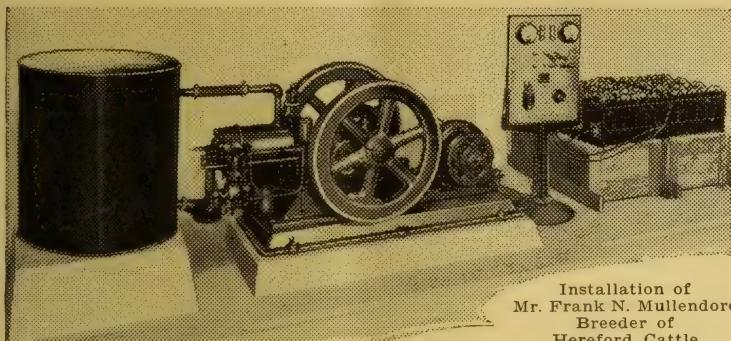
The Future of Draft Horse Production

By H. W. King.

THE fact that during the year 1918 and the fore part of 1919, the price of farm horses has decreased considerably, affords ample reason for us to turn with some little concern to the future of draft horse production. The census of 1910 showed that the average price per head of farm horses was about one hundred and eight dollars. In 1911 the price rose to one hundred and eleven dollars and the industry seemed to be flourishing. However, since that time the price has gradually decreased. In 1918 statistics show that prices were actually somewhat higher than they were the preceding year. However, the rise was so very little as compared with the rise of other products it was practically negligible. In

fact, it might even be considered as a further reduction of price.

Directly opposed to this condition we find two comparatively new industries teeming with business and producing in large numbers, products for which they are finding a ready sale. I refer to the industry of motor truck and tractor manufacture; machines designed to take up the work of the draft horse and evidently accomplishing their purpose. It is entirely unnecessary to point out the many places where the motor truck has "nosed out" the horse in the city. Practically as many places on the farm can be found where the trusty old horse has been supplemented by a truck or a tractor. Perhaps, after all, after years of superiority as a beast of burden, "Old



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Dobbin" has met a conqueror. It seems that the much talked of "horseless age" is at hand. On every side we find critics who are ready to tell us that the time of the draft horse is passed.

However, before we jump at the conclusion that our draft horse industry is doomed to destruction and plunge headlong into another business let us first take a glance at the history of the "ups" and "downs" of the horse industry. When the railroads first were introduced in this country men looked with disgust, at the slow moving horse drawn vehicle. They predicted that that form of locomotion would soon fall into the discard. However, horse-flesh held its own and to-day there are fifty times as many horses as there were at that time and their total value is five hundred times as great.

Again when the electric lines came into prominence and began to wind their way from city to city filling in the space between railroads, men again prophesied the downfall of the horse. However, the horse again not only stubbornly held his ground but continued to grow in numbers as well as in value.

With these facts staring us in the face we will be less hasty in our conclusion concerning the extinction of the draft horse at the present time. Perhaps the future of draft horse production is not so dark as some might conclude.

In the first place let us take into consideration that we are just recovering from a most abnormal period. There is no one who can truthfully say that the trend of the industry during the period through which we have just passed is normal or characteristic of the industry in normal times. During the war, the sole aim of the nation was to win the war. To do this there were two things necessary. The first was men, and the second was equipment including food and all things necessary to carry on the war. Men stepped forth to supply the first factor and others worked here to supply the second. Naturally it fell upon the farmer to produce the food. He was urged from every angle to exert himself to the utmost to produce food for the nation. He was told that so much of this product was absolutely necessary,

so much of it was indispensable and so on through the line of food stuffs. Great campaigns were staged to increase the production of wheat. The standard of pork production was moved up so many per cent on each farm. Sheep growers did not lack for encouragement in the production of the wool bearers of the country. Propaganda fell thick and fast, as it should, for the increase of these commodities, invaluable to all nations in time of war. The farmers' encouragement did not stop with propaganda, however. Prices for these commodities were much higher than formerly. Where the farmer was once able to get a certain price for this article he suddenly realized that he could get double that sum. With this as a prominent exciting factor the farmer gradually turned to food production. Other industries were not tabooed but the production of the necessities of life was so strongly emphasized that the number who did not contribute directly to this business grew fewer and fewer. Among the industries which suffered from this cause we most certainly must class the draft horse production. At the outbreak of the war the farmers were fairly well supplied with horse power. For the immediate period there was no special need for horses. Furthermore, although the horse business did not cease to pay, other phases of the farmer's business afforded so much greater profits that there was no special incentive for the continuance of horse production.

There remains still another factor to consider in accounting for the slackness of the industry during the war. At the first call for men we find a representative number of farmers enlisted. As time went on the farmer, left behind, faced with greater and greater seriousness the problem of labor. Being unable to find men to man his many horse-drawn implements he gradually dispersed that machinery and installed larger implements to enable one man to care for a larger area. With the old machinery went the horse for any price he would bring and the expensive tractor was installed regardless of cost. Now, that the war is over and we are returning



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to a normal basis the farmer will consider the actual cost of his investment and compare it with his former investment of horses. It is doubtful whether or not any but those operating on a larger scale will find their change a profitable one. When that is brought home the farmer will ruefully view the product of his quick action and with the slightest excuse will turn to the horse market to restock his farm with drafters. But as I pointed out above, horse production has suffered a great relapse in the last two years. Many of the smaller horse breeders and a few of those operating on a large scale have gone out of business. Farmers have sold their mares or else failed to breed them. As a result the number of horses on the market has decreased considerably. Where there was once a surplus of horses on the market continually there will then be scarcely enough to meet the wants of the most active buyers. Where once the rule of prices was low the law of supply and demand tells us that prices will be high. Probably the poorest horse on the market will sell for a price, which in 1918 would have purchased the best. Even now, according to Mr. E. B. White, president of the Percheron Society of America, there are not enough good horses to go around.

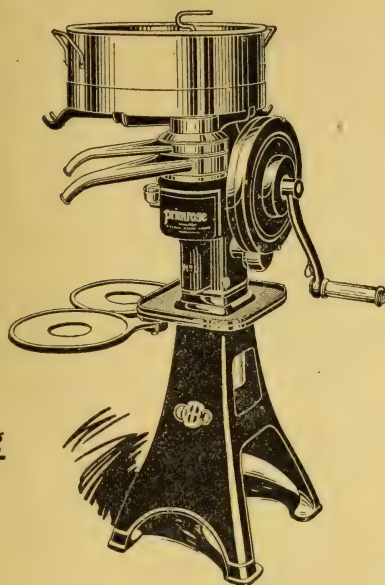
However in that statement he struck a note which is very noticeable in the writings of all horse breeders. I refer to the word "good." Practically all breeders are agreed that the future of horse production is bright but they add the future of the production of good horses is brighter. Mr. Robert B. Ogilvie says that the supply of real weighty draft horses has never been equal to the demand. It is not the scrub that is wanted but the large, powerful and active draft horse. It is a shame, according to Mr. Ogilvie, that the American farmer has never really been educated to the real meaning of the word "drafter." The word "drafter" is not properly applied to the twelve and fourteen hundred pound horse so commonly produced on the average American farm today. A real drafter of the type that tops the market, is an animal weighing at least sixteen hundred pounds. The ton

gelding should be made the rule instead of the exception. We need not fear the swift replacement of this type of horse by the tractor. Economy of power only, will be considered by the ordinary farmer when he is not working under pressure. Whether it be equine or engine, that power will be chosen which is most economical.

So far we have considered the horse industry only as it is related to our own country, but let us now consider the industry over a larger territory. After 1886 and up to the time of the close of the Boer war, Great Britain drew heavily upon our horse supply. As a result soon after the war we found our supply of horses in a similar condition to that in which it is at present. Prices immediately began to rise and good horses were held at a premium. However our active horsemen turned to foreign countries. We imported from France and Belgium in large numbers and within a few years the supply was back to normal. Today, however, the situation is entirely different. Devastated Belgium has lost practically all of her fine horses. France made a great effort to protect her breeding animals, but nevertheless, her supply is not equal to her own demand. The active market for draft horses in England very clearly points to the fact that she has no animals to send us. Our demand, therefore, must be met by our own breeders. Even when the foreign countries were able to supply us with horses it required some few years to recuperate from the British exportation of the Boer war period. Without their aid it will undoubtedly take longer. Furthermore at the time of that exportation interest in the business did not "lag" to the extent it has in the last two years. Men did not cease to breed their mares as they did during the years 1917 and 1918. At that time we had only to make up the number lost by our increased exports. Now, however, we have to make up for a period during which the exports were much greater than those of the Boer war period. In addition to that we have a further shortage for which we will have to make up due to a lack of production.

The 1920 Primrose at the 1918 Price

A study in manufacturing
and Farm Equipment
Economics



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Perhaps our own supply could be filled in a comparatively short time, but after that we will undoubtedly find a ready sale for our horses on European markets. As I pointed out above the great horse producing countries of Europe have been practically drained. If it were not for the lack of shipping space for horses, France would be buying rather extensively even now. Belgium has already sent a delegation to this country to investigate the possibility of replenishing her studs from this country. England has sent no such delegation but an investigation of her markets shows some startling figures. At their gelding sales, individuals old enough to work bring five hundred to eight hundred dollars. Unbroken colts bring as much as four hundred and fifty dollars and many outstanding individuals bring as much as one thousand to twelve hundred dollars. With these figures in mind Mr. J. G. Truman recently said that he expected a very large European trade as soon as conditions would permit.

Considering all phases of the horse industry the future seems comparatively bright. We have the strongest opposition in the form of the motor truck and the tractor. According to many prominent men who have studied this question rather thoroughly, this opposition will never displace the horse. They will all admit that for the long haul over smooth roads, the motor truck is playing and will play an important part. It will also be admitted that the tractor has its place on many farms, but it will be said with equal emphasis no mechanical power can completely take the place of the horse on the farm. Considering that the horse is still a necessity then, we find that due to war conditions the supply of horses is not nearly up to par. Furthermore, it does not give promise of being up to par for a number of years. Finally, from a nation of importers of our breeding animals we have suddenly been transformed to a nation to which others look for breeding horses. More breeders of the United States are today called upon to supply the world with draft horses. Mr. Alex Galbraith realized before the close of the war that this would

be the situation and he wrote an article from which the following is an extract:

"When the war is over and the various European countries re-stock their devastated farms, and when the enormous tracts of open prairie in the west and northwest come under cultivation, the demand for active draft horses will be unprecedentedly great and the prices probably will go higher than we have ever known. The idea of a horseless age, even in the distant future, is I think, impracticable and Utopian. Farmers of the present day will best consult their own interests courageously, increasing rather than reducing their draft breeding operations."

FARMERS TO LEARN PRODUCTION COSTS.

Eight demonstrations have been started by Union county farmers in co-operation with County Agent M. A. Nye to determine the cost of production on sows from the time they are bred until their pigs are weaned.

30,000 INDIANA FARMERS "KEEP BOOKS" THIS YEAR

More than 30,000 Indiana farmers will "keep books" on their business this year in record books put out by the agricultural extension department of Purdue University. Of this number more than 24,000 men received their books through banks in all parts of the state and more than 5,000 from county agricultural agents. One hundred and forty-six banks in 67 counties have obtained the books for their farmer patrons, and in some counties, especially Floyd and Wabash, every farmer will be supplied.

The record book contains spaces for farm receipts, expenses and inventories. It is designed to give information necessary for income tax reports and to help the farmer study his business with a view to increasing its profits. The books, which are recognized as among the best obtainable for corn belt farmers, were compiled by farm management specialists of the university and embody features gained by several years experience with thousands of Hoosier farmers who have kept similar records.

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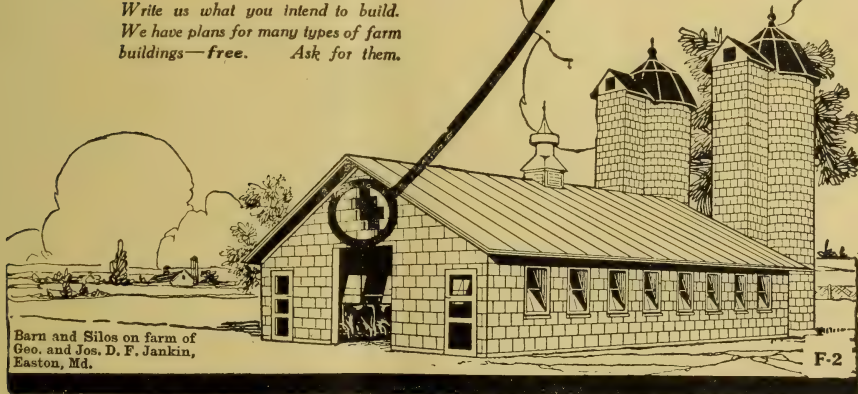
Whatever you intend to build, build it with Natco Hollow Tile. Many uses are pictured and explained in our book, "Natco on the Farm." Write for it today — *free*.

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Barn and Silos on farm of Geo. and Jos. D. F. Jankin, Easton, Md.

F-2

The Wart Disease as a Menace to the Potato Growing Industry in America

TO the steadily increasing number of serious diseases which stand ever ready to attack the crops of the American farmer, and for which he must be ever on the alert, one has been added of recent months which, if immediately taken in hand can be controlled with absolute certainty, and with but very little labor or trouble on the part of the individual producer. If permitted to spread at large, however—as has been the case in Europe, where we derived our initial infection, from seed brought over by immigrants it stands ready to overshadow and indefinitely reduce the productive capacity of one of the greatest potato growing sections in the world.

The disease referred to is commonly known as the Black Wart, and is of fungous nature. For some time past it has been known to cause very serious losses in England, Ireland, and other parts of Europe where it has been found that the soil once infected, will remain so for years. Since the infestation is usually introduced by the use of infected seed, it is readily seen how a little care can keep this serious situation entirely under control, and it is with this purpose in view that government regulations prohibit the importation of potatoes from these sections, and even interstate and local transportation from infected districts in our own country, for at the present time it is to be found, so far as known, only in two counties in Pennsylvania.

The first evidence of its presence in the plant is to be found in the small, spongy outgrowths which are found to appear most frequently from the eyes. As they increase in size, they take on a very repulsive appearance, being black, rough, and of a decidedly warty appearance—whence the name. Frequently several such protuberances are found to develop from the same tuber, thus reducing it to a spongy, warty mass. In the early stages of the infection the warts are light brown in color, becoming darker, and finally black as they grow and mature. Due to its very striking characteristics,

there is very little danger of mistaking it for any other disease under field conditions.

Perhaps the greatest difficulty that is to be experienced in the control of this particular disease is to be found in the fact that it can not be detected until the crop is being harvested, as the vines show no indications, whatever, of the infected conditions of the tubers. It is for this reason that every potato grower, whether he uses the row or acre as a unit, should be very much alert for signs of the disease at digging time.

The only really optimistic phase to be found in connection with the whole situation centers in the fact that, at the present time, the disease is not widespread. It should be remembered, however, that it is only through the closest cooperation of all potato growers that its infection can be held within its present bounds and thus give hope for its ultimate elimination. With this aim in view, it is to be hoped that all potato growers will respond to the appeal of pathologists all over the country, and upon finding tubers showing such or similar symptoms as described above, report the same to the County Agent, and, if possible, send specimens to the Plant Pathologists at the Purdue Experiment Station, West LaFayette, Indiana, and he will be very glad to furnish any additional advice, information or aid that may be requested.

During the World War American exports of milk products increased considerably more than three-fold. In 1914, 70,000,000 pounds of milk left the United States. In 1919 the total was 2,550,000,000. It was not the raw milk, of course, but for the sake of comparison the United States Department of Agriculture has reduced the figures to pounds of milk. Butter and cheese constituted the two items making up the total in 1914. In 1919, there was a big added item of condensed milk—something more than half the total.

—Hoard's Dairyman.

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"The Master Drive 3-4 Plow Farm Tractor of America"

The Illinois Super-Drive Tractor has power to pull four plows under most conditions, three plows under severe conditions, and to run threshers up to 28-inch—with plenty of reserve power. The Illinois is designed and built to give many years of dependable service.

The ILLINOIS Has Many Exclusive Features

The Illinois has a dependable high powered heavy duty kerosene burning engine which will give you great reserve power for unusually hard pulling and for running threshers up to 28-inch.

Its unit construction gives lightness of weight, combined with extreme rigidity, thereby insuring freedom from twisting of frame, preventing undue strain on gears and misalignment of bearings.

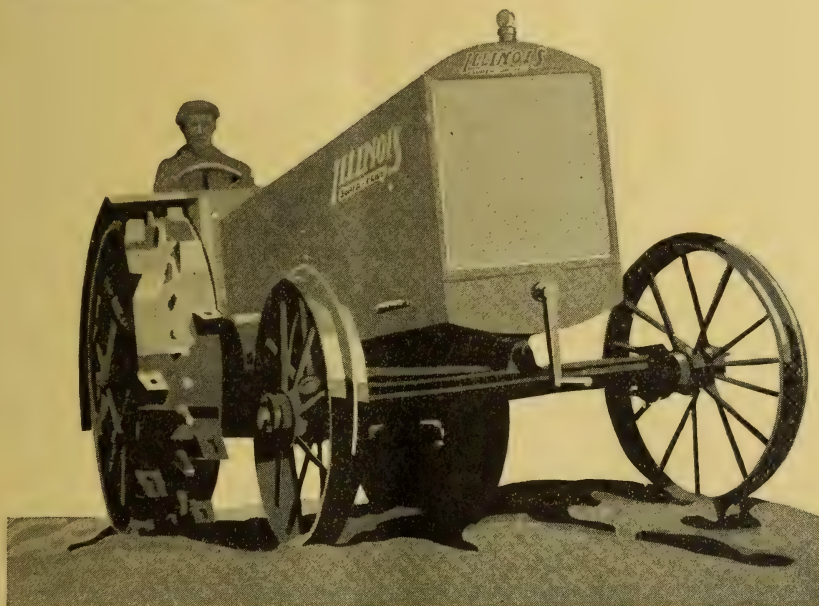
The transmission is entirely enclosed, giving protection against destruction caused by dust, dirt and grit. The Illinois Planetary Spur Gear Final Drive is a "Master Stroke of Genius." This principle relieves excessive tooth pressure on the final drive gears, prevents stripping of gear teeth, and insures perfect lubrication. This final drive combined with the high efficiency of the transmission

is the means of delivering 20% more engine power to the draw bar than any other driving principle in tractor use.

The drive wheels sustain 75% of the tractor weight and are equipped with sixteen powerful cushion springs, which, together with the powerful spring on the draw bar absorb the shocks to tractor mechanism and operator. The Illinois is easy to operate and to maintain. Its construction is simple, and all mechanism is easily accessible. It has a short turning radius. The Illinois has many more features of great interest and importance.

Our folder, "The Master Drive 3-4 Plow Tractor of America" tells all about its many exclusive features, and will be sent you upon request.

ILLINOIS TRACTOR COMPANY
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The Farm Fence

H. E. Engle '20.

IT is authoritatively stated that the building and maintenance of the farm fences in the United States has cost more than the construction of the farm buildings. To be successful in farming, as well as in any other business, it is necessary to reduce expenses to a minimum, and certainly, fences are to be classed as one of the major expenses of the operation and upkeep of the farm. The best way to reduce fence expenses is to use only good material and construct the fence properly so that when it is finished, the farmer will have something that will be worth while and can be depended upon to last a reasonable length of time—the longer the better. The annual cost of a good fence is much cheaper, to say nothing of the annoyance caused by a poor fence.

It seems that board fences about the barn lots give most satisfaction, mainly because they are short and because they can be easily repaired when damaged by stock, but since the passing of the rail fence, wire is the prevailing type for the major part of the farm fences.

In construction of a wire fence much importance should be laid on the posts to be used, since they are the foundation of the fence, and generally determine the length of life of the fence. For this reason this article will be concerned mainly with the post.

One of the big expense bills that the Indiana farmer pays annually is for fence posts. That bill is so large because weed posts which are almost wholly used, are short lived. Yet numerous tests extending over many years show that this heavy expense may be cut in two by preservative treatments which will prolong the life of wood posts from three to twenty-five years. One of the best indications of economic value of wood preservation is found in the attitude of the railroads of the country toward this work. Practically all of them are using cross-ties treated by one of the several processes and many of them have installed elaborate treating plants for doing their own work. They

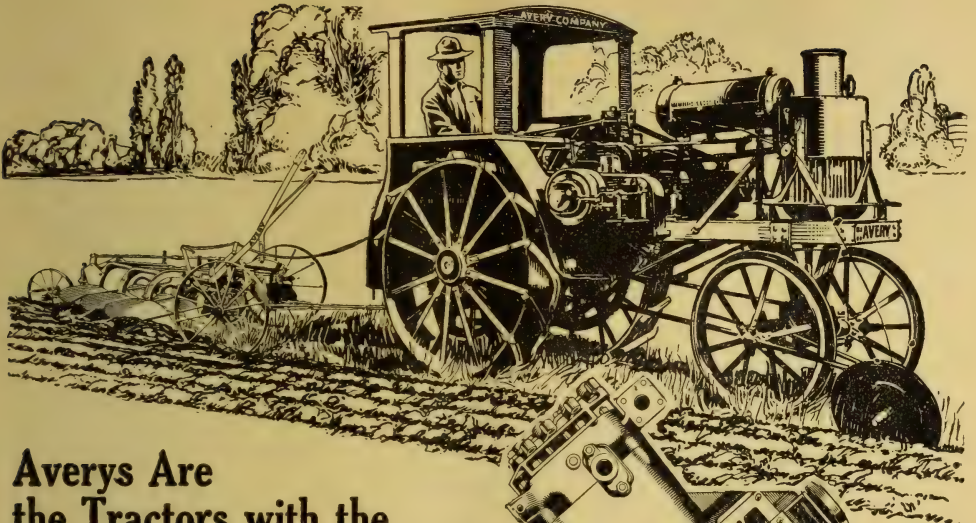
save large sums annually by increasing the durability of the ties. What is true regarding the durability of railroad ties under preservative treatment is true of fence posts. Both are subject to decay since both come in contact with the soil. If the farmer can reduce his fence post expenses by one-half or more, the saving is well worth his consideration.

Preservative treatment not only lengthens the service of the posts now commonly used, but it also makes possible the use of many soft woods which have been heretofore considered worthless. Many of the inferior soft woods have advantage over the hard woods since they take in preservatives more readily. It is well known that it is the quality and amount of preservative in a piece of wood and not the wood itself that determines the length of service of the wood.

Decay or rot in fence posts is caused by fungi and bacteria which destroy the wood structure. Fungus growth requires heat, moisture, and air besides the food which is supplied by the wood itself. This accounts for the excessive decay at the surface of the ground, as all requirements are sufficient at this point for the growth of fungi. The bottom of the post is generally well preserved because of a lack of air and heat.

Decay may be prevented by dipping the post into preservatives which, when absorbed, form a layer of wood in which fungus spores cannot develop due to poisoning of the food supply. Of these preservatives, creosote is by far the most important. It is made by distillation of tar-like substances, mainly coal tar.

Fence posts may be treated at any time of the year but generally the work should be done during the winter when other work is not pressing. The posts may be cut at any time and completely peeled as soon as cut. They should be well seasoned, but if cut during the summer they should be protected by shade to prevent large season cracks which are caused by rapid drying. A four-inch post after a good treatment with creosote will last practically as long as a seven-inch post



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Because of its low speed the power of the Avery "Draft-Horse" Motor is delivered through

The Avery Patented Sliding Frame Transmission

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These and other big features make Avery

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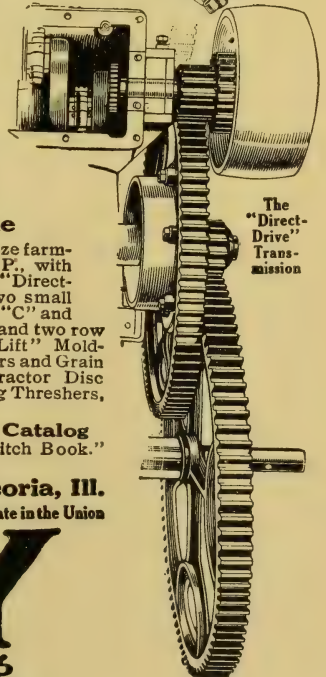
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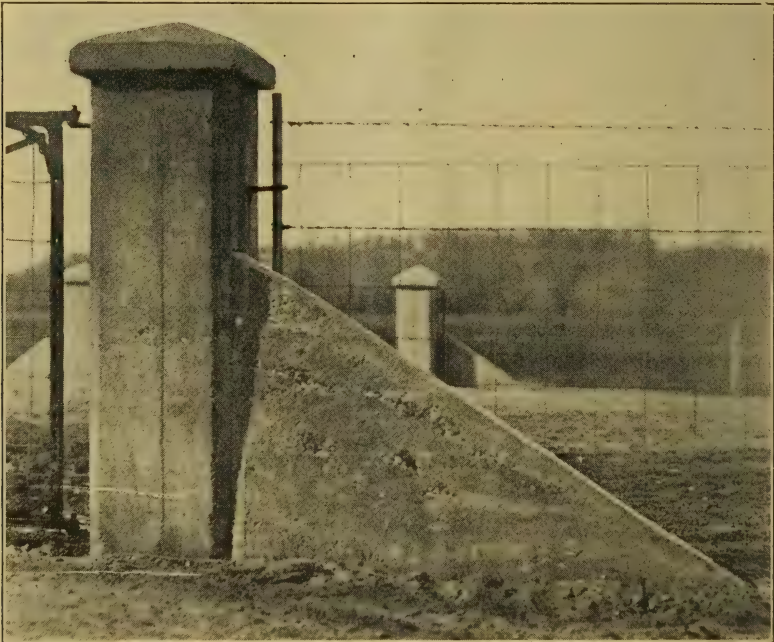


The
"Direct-
Drive"
Trans-
mission

and will absorb only about half the amount of preservative.

For the small farm or where no more than 100 posts per year are used, the equipment is very simple, all that is required being an ordinary steel oil-drum or barrel mounted on a brick foundation, which need not be very substantial as the tank can be taken in when not in use. This outfit will accommodate ten posts. In treatment, it is essential that the posts be submerged to such a depth that six

eral the posts to be utilized in treatment should be those near at hand, or those which may be secured at small cost, giving preference to the softer woods, since with these it is generally easier to get a good penetration of the creosote. The lighter woods are also easier to handle, will season more rapidly, and will last about as long as the heavier woods after treatment. The harder woods, as oaks and hickories, can be better utilized for other purposes.



Something of which to be justly proud.

inches of the treated end will be above ground when the post is in place. The fire may be started and the posts placed in the tank about noon. The creosote should reach a temperature of about 220 degrees F. about 3 p. m. and the fire removed about 7 p. m. The liquid should then be allowed to cool over night and the posts removed the next morning.

The determination of what kind of wood posts to creosote should be based largely on the price at which the posts can be secured. For example, the farmer having a soft maple grove in need of thinning would naturally use these trees for posts since they could probably be worked up into posts cheaper than any other posts could be purchased. In gen-

The following is a table showing length of life for fence post woods found in Indiana. (From Iowa Experiment Station).

Kind of Post	Untreated Creosoted	
	Years	Years
Ash	6	25
Basswood	3	27
Black Walnut	10	25
Box Elder	4	27
Burr Oak	12	27
Catalpa	18	28
Cottonwood	3	27
Hard Maple	4	26
Hickory	4	20
Honey Locust	12	30
Black Locust	30	37
Red Cedar	30	37

(Continued on page 356)

The Hessian Fly Situation

By J. Troop.

The wheat crop of 1919 in Indiana was injured but very little by the Hessian fly, and so it was generally supposed that the same would prove true for the coming crop but judging from the many inquiries which have come to this office during the fall and winter, it is very evident that there are many badly infested fields scattered over the state. In nearly every case investigated by this office it has been found that these fields were sown before the Fly-free date as sent out by the Department of Agriculture. Not all, however, as some who followed these directions have reported bad infestations. This was doubtless due to peculiar climatic conditions which existed last fall. Some have reported that fields that were sowed two or three days before the date recommended were badly infested while others close by, sowed three days after said date, were free from injury. In some sections of the state the date recommended for sowing was too early to miss the deposition of eggs. Ordinarily, however, if these directions are followed each year by every wheat grower there will be very little injury. The danger lies in the fact that in every community there are farmers who persist in sowing their wheat early so that it may get a good start before winter sets in. As a result if there are any flies around, these fields will surely catch them and then serve to spread the infestation the coming year. No remedy can be given which every farmer will follow. At least that has been true during all the years since the Hessian fly was introduced into this country.

But, the question has been often asked during the last few months, "What are we to do with these infested fields in order to prevent its spreading next summer?" In other words, the damage has been done, what are we going to do about it? Well, that depends upon conditions and the amount of infestation. I have found numerous instances where wheat was sowed after corn. A strip was sowed early and the corn was cut and shocked on these strips and then the main crop

was sowed. This last sowing being later has of course escaped the fly while the strips are full of it. In every case of this kind I have recommended that the strips be plowed, not disked, this spring and sowed to oats. This will save the remainder of the field. The same would hold good in case of a badly infested field. The wheat crop will not amount to much if left, but a good crop of oats or corn could be grown in its place, and then too, the crop of flies for the next year would be greatly reduced. Inasmuch as the fly pendulum is just beginning to swing back on its return trip, the parasites will not be numerous on the present crop, so the farmer will have to get along without their assistance this year.

Another question is sometimes asked:—"Can I sow barley on these infested strips this spring without danger from the fly?" The fly will attack barley as well as wheat and rye, but if these strips are plowed under early there will be no flies in that field to attack the barley. Again—"Will spring wheat be injured by the fly if sowed near an infested field?" There will probably be some injury to the spring wheat, if the infested field is adjoining the spring wheat. If it is some distance away, say forty rods or more, there will be very little danger, as the flies in this infested field do not have to migrate to other fields in order to find a suitable place on which to lay their eggs, as they frequently are obliged to do in the fall.

FARMERS BUY SPRAY MATERIALS EARLY.

Daviess county farmers are taking time by the forelock and ordering their orchard spraying materials now through local dealers. Last year the demands for lime sulphur, Bordeaux Mixture and other materials was so great that many men did not get their orders filled. They intend to prevent a recurrence of this feature this year.

A WORD TO THE FARM BOY.

We know of but one branch of education that has a certain, definite job waiting for the graduate when he gets his diploma, and that is an agricultural education. Every other profession is overcrowded. In this the supply is not equal to the demand, and will not be in the next twenty years. The farm boy who, having learned the practical part of farming, having familiarized himself with the machinery and become qualified to handle farm animals as they are handled on his father's farm, will take a thorough course at the Agricultural college and be just the kind of a man, provided, always, that he has the brains and grit, that the world is looking for today. You may devote yourself to horticulture, to stock breeding, to dairying, to butter making, to cheese making or to cattle feeding, and, if you have the stuff in you, you will find a job, and a good paying one at that, waiting for you at the end of the course. The colleges and experiment stations will require the services of a great many educated young farmers. It will not be many years before every live railroad in the west will have an industrial department, which no one can run who does not combine the theoretical with the practical. The kind of man required would cost \$5,000 a year.

The Department of Agriculture needs more than anything else, this kind of men, and boys without capital who will qualify themselves for this kind of work, will not need to wait ten or twelve years before they see a living clearly ahead of them.

As the years go on, it will become more apparent that the men who will farm successfully must have the "know how," which he can gain only by long experience and reading at home, or by an education plus reading and experience. Four years at college, or even two years, will be worth to you twenty years of farm life without it. Your motto should be not "Go West," but "Go to College if you possibly can. Go to an Agricultural College."

Don't start out to be a pure scientist; you want a broader education than that. It will pay you if you buy a farm of your own. If you are not able to do this, some-

body who has a farm will need you. The oil-meal folks were not long since looking for a young man to act as their agent who knew how to feed cattle and how to compound rations of which oil-meal is a part. Every line of business that has to do with farmers greatly prefers a man who not only knows how farming is done, but why it is done, and hence is in touch with the farmer.

Don't Go West, or South young friends; don't go to the city; go to the Agricultural college and to the agricultural end of that college. This should be the motto for every farm boy and it is his duty to live up to this motto.

FEDERAL GRAIN INSPECTION

How is the farmer affected by the Federal Grain Supervision? This question should attract the consideration of every grain grower and dealer in the United States and, especially in Indiana as it is in the heart of the grain belt.

The purpose of the Act is to provide for the establishment of a single set of standards of quality and condition for the various grains, and to provide for their uniform application to the shipments of grain, by grade, in both interstate and foreign commerce. It must be understood that the Act does not provide for direct Federal Inspection, but rather that the inspecting and grading be done by inspectors licensed for that purpose, by the Secretary of Agriculture. The licensed inspectors are not government employees. They operate independently, depending upon fees collected for their services, or they may be in the employ of a grain exchange, some local organization or the State Inspection Department.

A knowledge of the essential features of the official grain standards, will enable the farmer to know whether or not his grain is being properly tested by the mill or elevator. Now that farm work is rather lax, the farmer should be acquainting himself with this act which is of so much importance to him. Complete information may be had concerning the Act by applying to the Bureau of Markets, U. S. Department of Agriculture, Washington, D. C.

HOMCO PIG AND SHOAT FEED

Pigs root for elements essential to growth that are not always present in the soil.

HOMCO Pig and Shoat Feed is a highly concentrated ration to the degree of furnishing in natural form elements necessary to rapid construction of a big well-covered frame.

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and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

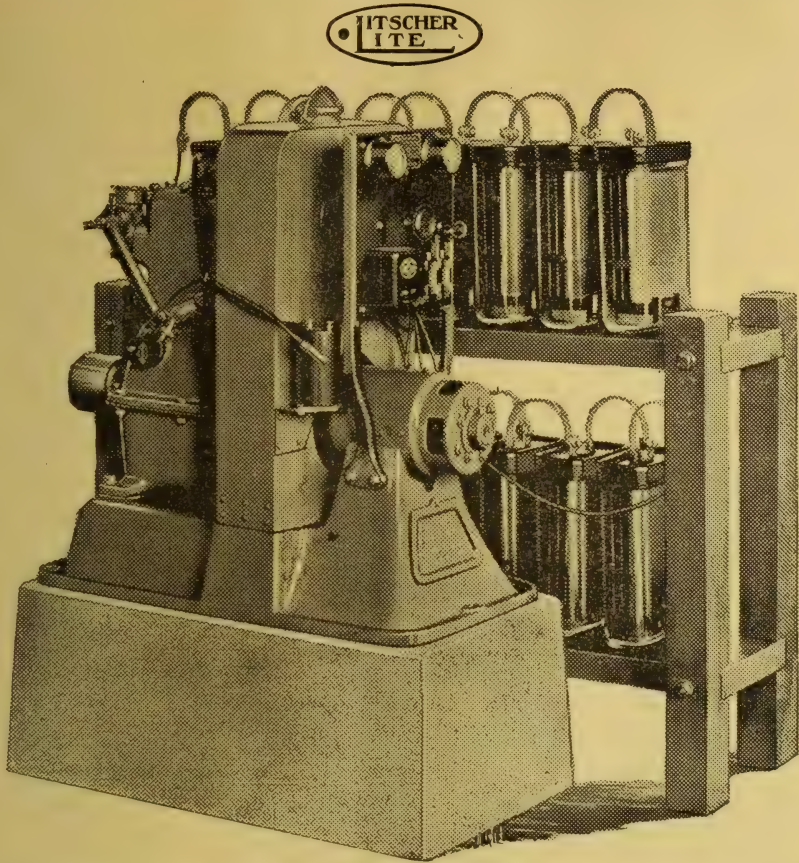
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Alumni and Local

By O. B. Riggs.

1893.

W. E. Lawrence is farming near Columbia City, Ind.

1912.

H. H. Cecil is farming near Selma, Ind.

1914.

Frank C. Beall is farming the Elmcroft Farm at Clarksburg, Ind.

J. D. Luckett is with the U. S. Department of Agriculture at Washington, D. C.

E. P. Scott is farming near Galveston, Ind.

J. F. Woodcock is Field Superintendent with the South Bend Creamery Co., of South Bend, Ind.



Peter J. Lux, America's corn king. Another son of Hoosierdom.

1915.

J. E. Pyke is a livestock salesman with the Springfield Union Stock Yards Co., of Springfield, O.

R. E. J. Sebald is farming and living at Monroe, O. He is married and has one daughter, Jeanne Louise, two years old.

1916.

L. R. Bobrink died at the Christ hospital, Cincinnati, as a result of pneumonia, following an operation for appendicitis.

G. H. Castrup is teaching mathematics and agriculture in the Burns City High School, Burns City, Ind.

G. F. Clark is associated with the Wal-kill Stock Farms Co., of Green Cove Springs, Fla.

1917.

D. C. Davis, Wilson & Co., Chicago.

H. G. Templeton is Executive Secretary of the Indianapolis Real Estate Board, of Indianapolis, Ind.

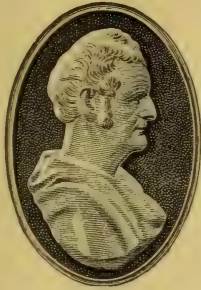
L. J. Fultz is associated with Fultzfolk Farm Co., at Salem, Ind.

1918.

J. R. Hoffer has taken his Masters work at Ames, Iowa, and now has charge of Rural Sociology at that place.

G. A. Branaman is farming near Bedford, Ind.

J. H. Lefforge is the High School Agriculturist at Montevideo, Minn.



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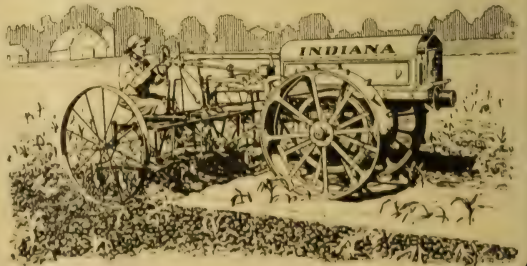
THIS one-man, single-unit tractor works not 25 or 30 days a year but as many days as you now use your horses for field work. Plows as much as two good horse teams, cultivates, pulls harrows, discs, drills, rollers, mowers, binders, potato diggers and orchard tools.

There is no riding implement that it does not hitch to. Numerous users have eliminated horses entirely in farm work. Excepting for the plow it uses the horse tools you already have without expensive hitches. One man does the work, riding on the implement. The Indiana tractor weighs no more than a farm team. There is no excess weight to drag around and no waste of fuel. The Indiana does a year's work of four horses at a gasoline and oil cost, that is less than half the cost of feeding and keeping the teams for a year. Farmers who have big four-wheeled tractors are now buying the Indiana to work their row crops and prepare the seed bed when the ground is too wet for a heavy tractor to work on it.

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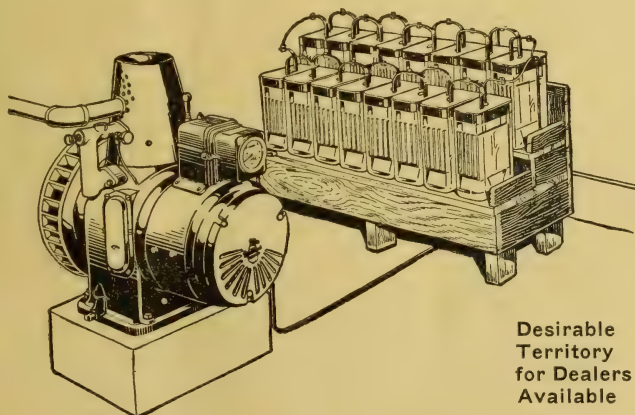


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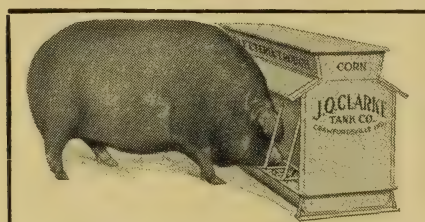
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The Willys-Knight Sleeve-Valve Engine

STOP THE DECAY OF TREES.

Whenever the limb of a tree is blown off or becomes diseased, the stump should be sawed off even and painted with creosote or tar paint; otherwise decay will set in and spread to other parts of the tree. Oftentimes even a nail hole will so injure the bark that it will come off leaving the wood underneath unprotected. If these spots are left bare, decay will set in and seriously endanger the tree. A coat of creosote or tar paint will prevent spread of decay and gradually the bark will grow over the bare place again.

**Our World's Best Cafeteria Feeder**

is the most **wonderful** feeder on the market. Will feed down and out **all kinds of feed** better than any other feeder. Write for catalogue today.

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-tile the wet spots

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Make the ground porous. Allow the fertilizing elements to get into the sub-soil.

Use Well Burned Clay Tile.

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Indiana Drain Tile Mfrs. Assn.

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April 1st, dairy herdsman, capable of taking management of 20 cow registered Holstein dairy, with young stock and hogs. Man with Agricultural College Short Course training preferred. Permanent position for the right man. State experience and monthly salary expected, with references, in first letter. Address Box B, care of the Purdue Agriculturist, West LaFayette, Ind.

STATE.

More legumes, especially clover, must be grown in Indiana if this state is to maintain its place in the agricultural world, according to W. A. Ostrander, head of the soils and crops extension force of Purdue University. The war-time agricultural program cut down the acreage of legumes and "we must not only get back this acreage in the rotation, but also much more than we previously had," he said.

A recent survey showed that out of the 92 counties in the state, 26 had less than one acre of every fifteen in legumes. The most successful farmers of the state recognize the fact that there must be at least one acre in every four in some

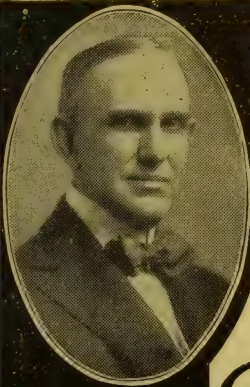
legume. Soybeans, cowpeas, alfalfa, sweet clover or vetch may be used where a stand of clover has failed, although soil treatment, such as the use of limestone, may be necessary.

The high prices of vegetables last year should encourage many folks to grow gardens this year.

Have you gone over the vegetables in the cellar lately and removed any that are beginning to decay?

MONEY IN POULTRY AND RABBITS

We show you where to market all you raise at a profit. 62 page, illustrated book, 50 cents. None free. Co-operative Supply Co., Dept. 10, St. Francis, Wis.



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Facts**

Ditching and Soil Washing Problems Solved

LET me show you how to solve the drainage, irrigation and soil washing problems at low cost. I'll show you how two men can now do more ditch work than 100 men by old methods. This is the year to save labor and do this work swiftly and efficiently. I'll show you the way. Write for the new book that tells the story.

THE Martin
O.D. & G. CO. REGISTERED

Cuts V-shaped ditch for open drainage, irrigation or tile any depth down to 4 feet, leaves smooth, hard sides. Also use it for back-filling tile ditches and holes. Perfect machine for cleaning old weed-clogged ditches. **All steel—reversible to throw dirt either side. Adjustable for narrow or wide cut. No wheels, cogs or levers to get out of fix. Lasts a lifetime.**

Farm Terracing

Builds farm terraces which stop washing of soil on rolling and hillside land and hold the water where it should remain; reclaims abandoned washed land; throws up dikes and levees; grades roads; works in any soil, wet or dry; 2, 4 and 6 horse sizes; large size fine for tractor. Needed on every farm.

Get Your Farm in Shape

Chance of a lifetime to make big money the next five years. Here is crop insurance at a low cost. Write and find out how to make big crops sure. New free book on drainage, irrigation and terracing. Write for this and our proposition. Address W. A. Steele, Pres.

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Portable Smoke House

With this wonderful smoke house, home curing, smoking and storing of hams, bacon, sausage and fish become practical and easy.

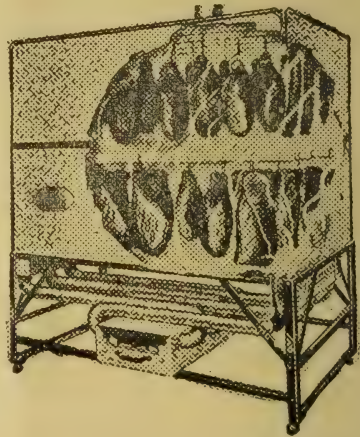
It is compact and can be taken through an ordinary door. Made in all sizes, ranging from two-hog capacity on up.

Can be operated from chimney same as stove and requires very little attention. Smoke goes through an air-cooled radiator before reaching meat, and can not overheat.

Glass doors, to watch operation, absolutely fireproof, complies with all fire insurance laws, saves money and does the work very satisfactorily.

Write today for circular explaining the greatest common sense smoke house built right here in Indiana.

Guaranteed by manufacturer for at least 20 years. We have some desirable territory open for live dealers and agents in Indiana.



Sectional View of the Eureka

O. K. SLATER

49½ SOUTH DELAWARE ST.

INDIANAPOLIS



Did You Ever Own a Calf?

If you did—all your very own—I'll wager you took a lively interest in caring for it and watching it grow. It's human nature to take a greater interest in the things we own and that represent possible profits to us personally.

The most effective method of interesting boys and girls in agriculture is to let them have a part in the farm livestock or crops, and let them invest, save or spend the profits as they wish.

DEVELOPS SELF-RELIANCE

This method teaches them how to raise good stock and crops, develops their self-reliance and prevents them from becoming restless and dissatisfied with farm life. You will find the majority of the boys and girls will save and reinvest their profits wisely instead of spending them foolishly.

The boys and girls who have this opportunity will want to continue to learn all they can about agriculture. Many of them will attend the agricultural colleges in order that they may be as well equipped as possible to make a permanent success on the farm.

Successful Farming, published at Des Moines, Iowa, is doing everything it can to help farm boys and girls realize their hopes. The future of the country lies very largely in the hands of these boys and girls. Agriculture must be made so attractive and profitable that they will choose it as their vocation.

It is the duty of the farm magazines to help farmers collectively and individually. Successful Farming is boosting the club work at every opportunity, even to the extent of offering valuable prizes to those who excel in the different branches.

SUCCESSFUL FARMING HELPS

In order that every farm boy and girl may have an opportunity to compete for these and other prizes, Successful Farming loans them money, without security, to buy a calf, pig, chickens, or seed for a field or garden crop. The boys and girls who borrow money in this way, instead of having their parents give them a calf or pig, gain the actual business experience, and take a more active interest in the project.

This is one of the many helpful service departments of Successful Farming. This magazine is doing everything it can to help the cause of agriculture. The subscription rate is reasonable—\$1 for 3 years. Sample copy on request. Write us if we can be of service to you.

SUCCESSFUL FARMING

THE FARMERS' SERVICE STATION

E. T. MEREDITH, Publisher

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☐ Please send sample copy of Successful Farming

Name..... R. F. D.....

P.O..... State.....

1919.

W. E. Leer is assistant in the Crops department at Purdue.

L. E. Bray is married and farming near Monrovia, Ind.

R. L. McCally is in the A. H. Department at Purdue.

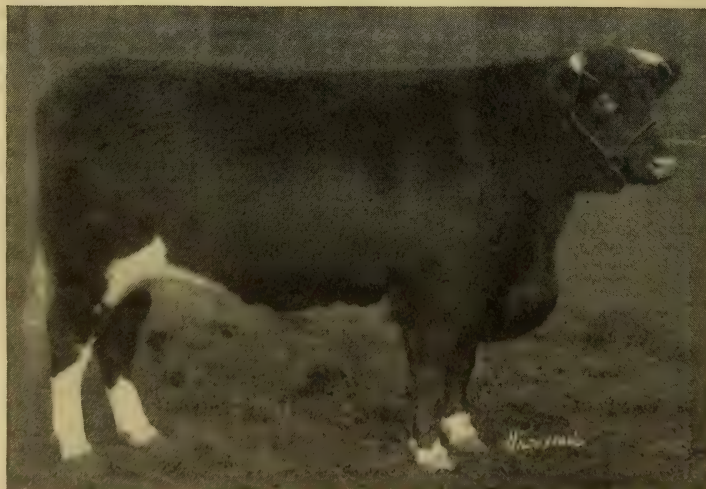
J. R. Murray is married and is farming near Grass Creek, Ind.

O. V. Morgan is farming with the Morgan Corporation Co., near Kokomo, Ind.

W. G. Weigle is farming near Montpelier, O.



New horse barn on Purdue University farm which will provide suitable facilities for handling a number of pure bred horses.



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Try us on your next catalog of sale.

An Experienced Veterinarian who knows stock and how to advertise it, at your service to help plan your book.

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and ELECTROTYPING COMPANY**

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INDIANAPOLIS, IND.



Louis Methers says:

"The Perfection is the best rig ever invented."

DROP in at Louis Methers's Farm round about milking time some day and you'll find him out in the barn with his neighbors around him watching his Perfection Milker do the work. Every man who knows Mr. Methers knows about the success of his Perfection and wishes he had one, too. One Perfection in a community always brings many others as soon as folks see what a labor saver it is. "I cannot say enough for the Perfection Milker. It is the best rig ever invented," says Mr. Methers.

"You can use the Perfection two times a day the year 'round, and it never balks or refuses to work on Sunday night like some hired men do. I have used my Perfection for one year now and it has never failed yet. There is some

one here nearly every night that wants to see the Perfection and stay for milking time."

The Cows Like It

When it's late at night and the cows are hot and restless, it's mighty easy to get mad and kick a cow or milk her hastily and hurry away. The Perfection is the only hired man you can depend on to milk every cow exactly the same every day. "The cows like my Perfection better than hand milking," says Mr. Methers. "I had one cow that cut her teat all to pieces in the fence and the only way I could milk her was with the Perfection. I have one double unit but I am thinking of enlarging my dairy by Fall. With the Perfection I can milk as many cows as I can own."

Names, Addresses and Catalog Sent Free

We will gladly send you names and addresses of Perfection owners. Write to them yourself and see what they tell you about the Perfection. We will also send free a copy of "What the Dairyman Wants to Know"—the great book that answers every question about milking machines. Write today.

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2146 E. Hennepin Avenue

Minneapolis, Minn.

The Perfection is the Milker with the Downward Squeeze Like the Calf.

PERFECTION MILKER.

THE FARM FENCE.

(Continued from page 340)

Red Elm	7	25
Red Oak	6	20
Red Mulberry	35	40
Soft Maple	4	27
White Cedar	14	30
White Elm	4	25
White Oak	17	30
Willow	4	27

Concrete posts have been tried by farmers with the hope of more perman-

ent results but have failed in a great many cases. However these failures should not condemn concrete posts in general as the failure is due to fault in the materials or in the process of making them. The person who mixes concrete is in a sense a creator. If he overlooks the proven methods of preparing and placing concrete, a faulty product will result, and those who suffer by this will be inclined to condemn concrete as a constructive material. A few broken posts in a fence may cause a sweeping rejection of the type rather than an inquiry as to whether or not they were properly made. Cases of this kind are usually due to the lack of appreciation of the fact that personal care is important in post making. The sand and gravel must be

LaFayette Milling Co.

Manufacturers of the following
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FLOUR

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BEST"

"SILVER MOON"
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White Rock Chickens

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Feeding of Texas Bred Hereford Baby
Beeves a Specialty.

Boost Your State and Help Purdue**E. RAUH & SONS FERTILIZER CO.**

Union Stock Yards

INDIANAPOLIS, INDIANA

Manufacturers of

HIGH GRADE MIXED FERTILIZERS ACID PHOSPHATE

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Live Stock Commission Salesmen

REFERENCE:—Live Stock Exchange Bank, Indianapolis; Indiana Nat. Bank, Indianapolis; Washington Bank & Trust Co.; City National Bank, LaFayette, Ind.

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As we meet you on the level, we'll treat you on the square.

Soliciting your patronage, thanking you in advance for any favors shown us, we are,

Very truly yours,

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UNION STOCK YARDS

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WEST WING EXCHANGE BUILDING, ROOMS 27 and 29.

UNION STOCK YARDS

INDIANAPOLIS, INDIANA.

suitable, enough cement must be used, and reinforcement must be of the proper size and properly placed. The mixing and filling of the molds must be correctly done and the green posts should be properly handled. Following are some of the requirements for making posts:

Clean hard well graded materials.

Proportions—1 part cement, 2 parts sand, 3 parts gravel.

Thoroughly mix with clean water to a quaky consistency.

Sufficient and properly placed reinforcement.

Careful handling of green posts.

A curing period of at least thirty days.

With a good concrete post made next comes the question of fastening the fence to it. Wires placed in the post never come at the proper place and are not practical. Holes to pass wires through will weaken the post. Boards clamped to the post will rot and need to be replaced. The Western Union tie seems most satisfactory. It consists in wrapping a wire around the post and twisting both ends around the line wire of the fence. This, of course, is no small task. Unless every line wire is fastened the fence has a chance to buckle and slide down the post. After all, it would seem that a good wood post well treated, will last as long as most concrete posts, unless best results are obtained, and the post will be just as cheap, will be much lighter, more easily handled and the fence can be securely and easily fastened to the posts with staples.

Whatever difference of opinion may exist as to the reliability of concrete posts



**Our
No-Freeze
Stock
Fountain**
is a wonder.
It keeps the
water warm
in winter, cool
in summer.
**Can move
your water
supply to any
part of the
farm.**

Write for catalogue today.

J. Q. CLARKE TANK CO.
N. Walnut St., Crawfordsville, Ind.

A Special Service for Inventors

All inventions are but the outgrowth of an idea. IDEAS are the foundation of success, but they must first be made realities and put to work before they have any real commercial value.

IDEAS of merit plus our SERVICE means success for the originators. Our success can only be built upon the successful outcome of our client's ideas.

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Spring Styles

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Society Brand Stein-Bloch

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Michaels-Stern

are ready for your inspection.

SEE OUR WINDOWS

THE HUB

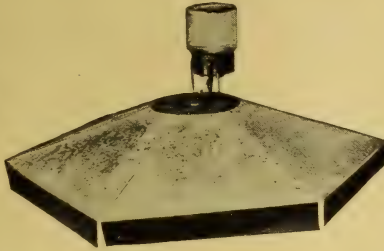
Ben and Joe Hirsh

West Side Square

No-Cold Brooder Stove

BLUE FLAME WICKLESS BURNER

No cold brooder stove in the morning if you use the No-Cold



The Greatest oil burning brooder stove ever invented

The No-cold Brooder Stove is the only oil burning stove that will hold the heat up to required temperature during the night. It will hold the temperature as accurate as an incubator. The needle is constructed so that flow of oil never reaches a danger point. Burner is absolutely wickless and will burn for weeks without clogging or sputtering. Perfect circulation of air which is very essential in raising strong healthy chicks. Stove has cast metal top. Glass Oil Fount. Strong and rigid as a coal stove. Burns kerosene oil. Broods from 100 to 600 chicks. Write today for illustrated catalogue.

Electric Hen Incubator

Hatches as strong chicks as the hen. Three 100 per cent hatches by inexperienced operators last spring. We also list Poultry Supplies. Send for complete catalogue.

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Agents and Dealers Wanted.

Constant Improvement

The advent of the separator, milking machine, gasoline engine, and other labor saving devices has not only revolutionized dairy methods, but has also stimulated investigation of cleaning problems in the dairy.

This investigation has demonstrated the failure of soaps and cleaners with grease or caustic content to provide the sanitary cleanliness necessary to the production of highest quality milk products.

Today thousands of the most successful creameries and dairies are using



because not only does it produce a sanitary cleanliness that protects the milk quality, but its efficient cleaning properties also minimize cleaning costs.

Should not your business judgment prevail on you to profit by the experience of others and standardize this cleaner in your establishment?

Order from your regular supply house. It cleans clean.

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in every
package.

THE J. B. FORD CO.,
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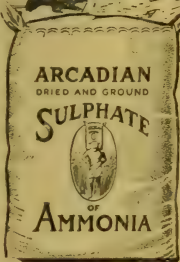
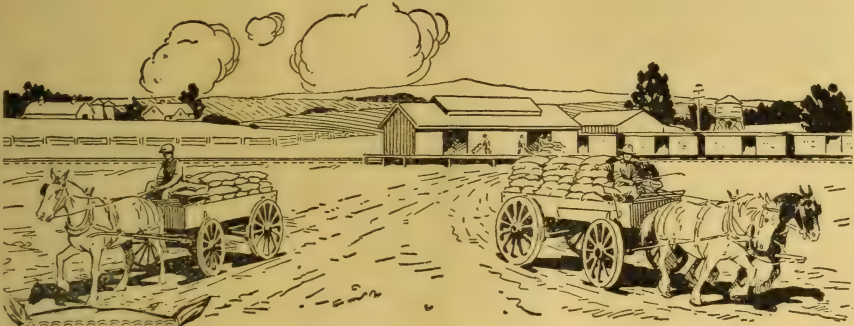
for the fence lines, there seems to be a widespread opinion that the concrete corner post is a most desirable improvement on the farm. They are often used by farmers who prefer wood or steel line posts. Owing to their weight, corner posts are usually made in place. A hole about four or five feet deep, flaring at the bottom is dug. It is well to cut the hole so that the wing braces may be dug to take the pull of the wire. These need not come above the ground if the post is twelve or more inches in diameter. Four reinforcement rods about three-fourths inch in diameter should be placed so that there will be at least an inch of concrete between them and the outside of the post. In filling the molds, it will be found best if the concrete is mixed just wet enough so that it can be shoveled without running off the shovel.

With the end posts in place and the line posts set in a straight line, 16 to 20 feet apart, we are ready for the fence. The fence should have at least No. 9 line wires and No. 9 or No. 10 stay wires, and all should be well galvanized. The question of six or twelve inch stay is much discussed, but if the fence is heavy, the twelve inch stay is practical. An eight inch stay if available, is all right, but it is doubtful if a six inch stay on a heavy fence is practical. The fence should be stretched tight, securely fastened to the posts and a heavy barbed wire stretched above the fence immediately, before any of the stock have learned to reach over it. A fence put up in this manner is a valuable asset to any farm, and a farmer having a complete equipment of this kind of fences has something of which he may be justly proud.

Carson's Drug Store

KODAK FILMS
DRUGS AND
SCHOOL SUPPLIES

306 State St., West LaFayette



TOP DRESSING TALKS

Which Source of Nitrogen is Best?

The advantages of Arcadian Sulphate of Ammonia are:

High Production: Pound for pound of nitrogen, Arcadian Sulphate of Ammonia will produce as much crop or more than any other nitrogenous top-dressing. It's dependable.

High Concentration: Arcadian Sulphate of Ammonia contains one-third more nitrogen than any other top-dressing. This lowers cost of handling, hauling and storing.

ARCADIAN *Sulphate of Ammonia*

Quick Availability: Arcadian Sulphate of Ammonia acts quickly. The moisture in the soil immediately dissolves the crystals. In many cases a change in color of the foliage of plants has been noted within three days after application.

Non-Leaching: The ammonia is absorbed by the organic matter and by other soil constituents, and is not easily washed out, even from the lightest soils. It is made available by the same conditions of warmth and moisture that causes plant growth, and this acts as a reservoir of plant food in the soil, yielding a regular supply of nitrogen as it is needed.

Fine Mechanical Condition: The crystals of Arcadian are fine and dry. There is no appreciable absorption of moisture and it does not cake into hard lumps. This makes application easy and assures even distribution by hand or machine. No labor is required for grinding or screening.

These with other important advantages, including low price, make Arcadian the supreme top-dressing fertilizer. As a feeder of plants, it is quick, enduring and satisfying.

Write for bulletins on the proper use of Arcadian Sulphate of Ammonia.

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AGRICULTURAL DEPARTMENT, NEW YORK

HAYWOOD PUBLISHING COMPANY

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If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

COMMON AILMENTS OF A CREAM CHECK.

(Continued from page 312)

few examples will make this clearer. A farmer received this statement from the creamery: Cream 45 lbs; test 38 per cent; Butter fat 17.1 lbs; price 68c; total \$11.63. This was perfectly satisfactory, but the next week it read thus: Cream 51 lbs; test 33 per cent; fat 16.8 lbs; price 66c; total \$11.08. The first figures the patron saw were the test and the amount of the check both of which were lower than the previous week. He immediately connected the smaller amount with the low test and accused the creameryman of being dishonest and thieving in his practices.

Let us, however, look more calmly at the remainder of the statement. We find that although the test is lower, the number of pounds of cream is six pounds higher, which is exactly within reason. The farmer obtained more cream from the same number of pounds of milk given by the same number of cows, so it necessarily was thinner and tested lower. Comparing the next number of pounds of fat, we find that the second statement showed practically the same number of pounds as the first. Does that indicate that the creamery was dishonest? The reason for receiving more pounds of cream and lower test the second time may easily have been due to turning the separator at a slower speed or using larger amounts of skim milk or water to flush the bowl. Now as to the smaller amount of money received for the second can of cream. The price, over which

The Varsity

Rapid Shoe Repair Shop
guarantees finest workman-
ship and perfect satisfaction

Jacob Bossung

302 State Street. West LaFayette



The Feed that makes the Yield

Cut Down Your Cost

A number of the most successful dairy-men testified before the Federal Milk Commission, which has been fixing the price of milk from the producer to the consumer, that they had cut down their costs of production by feeding **Corn Gluten Feed** and wheat bran freely in grain rations they mixed themselves.

The Commission must have been convinced by what these representative good dairymen had to say about different feeds and the economy of a man's mixing up his own rations.

For, in arriving at the price it thought the dairyman ought to get for his milk, the Commission based its calculations on home-mixed rations in which Corn Gluten Feed was a principal basic ingredient.

Made by
Corn Products Refining Co.
New York Chicago

Chicago Office: 213 E. Illinois Street.

If you have not yet fed Buffalo Corn Gluten Feed, if you want to know more about how to feed it, and your dealer doesn't happen to have it, write us—giving his name.

very few creameries have control, dropped two cents with the result that a smaller amount of money was received even though the pounds of fat were practically the same. The amount of the check was in no way due to the drop in test as the farmer had supposed.

Report the Dishonest Buyers.

Now lest this article seem to put all the blame on the cream patron let this be said. There are still a few unscrupulous cream buyers doing business and the sooner they are detected the better for all parties concerned. Before accusing the creamery of dishonesty, however, be sure that the drop in the test is not due to some of the previously mentioned factors relating to the farm.

It is far better to tackle a thing, make a dozen mistakes and get somewhere, than "not to try."—H. R. M.

Past Associations: "What do you keep the old mule around for? He's no good." "I know, but he's the only thing around the place now with a 'kick' in it."—Baltimore American.

PURDUE LAMBS AGAIN TOP CHICAGO MARKET.

For the eighth time in the last nine years, Purdue University has topped the Chicago market with western lambs that have been fed by the Experiment Station. The most recent time was last week, when 194 head, averaging 83 pounds apiece, all graded as prime, sold for \$20.10 per hundred. This was ten cents above the market price for that day and the excellent quality and condition of the lambs fed at the Purdue experiment station helped strengthen a market which had been weak for several days.

"One load of prime 83 pound western lambs, fed experimentally at Purdue university, sold at \$20.10 to a city butcher and got a packer bid of \$20, but they were in a class alone among morning offerings," says a Bureau of Markets report on the day the lambs were sold.

Eight lots of the lambs were in a 100 day feeding experiment. They cost $12\frac{1}{2}$ cents a pound last October. The lot of 25 receiving the standard ration of shelled corn, cottonseed meal, silage and clover hay showed the most profit this year as they have in eight out of the nine years the feeding has been done. Their average profit was approximately \$4 per head, but some of the other lots pulled the average on the 194 down to \$2.75 per head. The best lot gained .34 of a pound per day. Another lot of the lambs on the same ration, but receiving only a half feed of corn, required 117 days to make the same gains as the best lot did in 100 days and another bunch receiving the same ration except corn which was fed the last half of the period, required 113 days to catch up with those receiving a full feed of corn.

"The experiment this year bore out previous results and showed that it required practically $3\frac{3}{4}$ pounds of concentrates, $4\frac{1}{2}$ pounds of silage, and three pounds of clover hay for every pound of gain made by the lambs," said C. M. Vestal, who had charge of the feeding work. This made a cost of 15 cents per pound.

More Indiana farmers should be finishing lambs for market, thus utilizing grain and roughage grown on the farm, much of which now is going to market.

National Drain Tile Company

Largest in the World

Manufacturers of

DRAIN TILE

Annual Capacity
6000 Car Loads

Sizes: 4-inch to 33-inch inclusive.

TERRE HAUTE, IND.

Office:

Room 120, Rose Dispensary Bldg.

Factories at Summitville, Ind.,
Hillsdale, Ind., Terre Haute, Ind.

Over Forty One Million Dollars!

An enormous sum
—and yet,
large as it is—

We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the **SEVEN** largest Live Stock Commission Houses on the Chicago Market and we are also one of the **SEVEN** largest Houses on the Kansas City market.

We sell the experimental and fat cattle for the Animal Husbandry Department of Purdue University, Illinois State University and the Missouri State University and also the Experimental cattle from Worcester, Ohio.

LET US HANDLE YOUR NEXT SHIPMENT

Alexander Conover & Martin

LIVE STOCK COMMISSION

U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

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RIDGEVILLE, INDIANA

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HOW TO CALCULATE THE VALUES OF BORDEAUX MIXTURES.

(Continued from page 315)

tures. It can easily be seen that preparations showing very rapid subsidence will require thorough agitation, which in turn will necessitate the use of a sprayer provided with a very efficient agitator. It is very important that the mixture be in thorough suspension, in order that the spray will furnish sufficient copper to control the diseases which the grower wishes to combat. And as spraying is a question of insurance, he must decide whether he wishes to insure his crop wholly or only partially against fungous diseases.

Do not neglect prevention of lice and mites just because it is cold. Now is the time to get ahead of them while they are not multiplying very rapidly.

A light, evenly spread covering of straw placed on wheat in winter prevents baking of the soil in spring and improves the chances of the clover seeding.

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West Lafayette, Ind.

GROWING SUGAR BEETS IN INDIANA

(Continued from page 320)

distinguish between beet sugar and cane sugar. If past results are any indication of future possibilities, America will be producing her own sugar at some future date, and the greater part of which will necessarily be manufactured from sugar beets.

THE POSSIBILITIES OF THE OR- CHARD BUSINESS IN SOUTH- ERN INDIANA

(Continued from page 322)

used. His trees have very heavy foliage this year and very great vitality, due to the fact that much fertilizer had been used. The frost last spring had very little effect on this orchard, while some of his neighbors, who do not spray, cultivate or take care of their orchards have not enough apples for their own use.

Had it rained in the early part of July this year Mr. Harbin's orchard would have produced possibly 300 barrels of apples more on account of the increased size of the apples.

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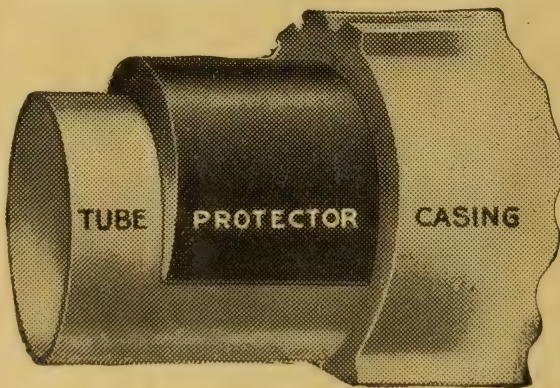
Mr. Harbin is not a young man, but is nearing 70 years of age, yet he looks after the general work of the orchard and directs his men what to do and when to do it. Mr. Harbin says that his only regret is that he is not 20 years younger, for he sees the possibilities of the orchard business.

ESSENTIAL FACTORS IN RURAL LEADERSHIP.

(Continued from page 325)

earned his salary or so long as results appear immediately beneficial to him, his success is doubtful. Almost unnoticed he will likely find his power, and even his reputation diminishing in the community.

The rural community leader must possess infinite patience. Discouragements are bound to arise. Results may come slowly at first. It may take years to see the fruits of honest endeavor. The time may seem long before the people will co-operate. It is interesting to note, however, that the community which stubbornly yields to a constructive pro-



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gram usually reacts in a favorable way with an equal force and persistence. Leadership demands constancy of purpose, and persistence in the last degree. a temperament that he will get pleasure temperament that he will get pleasure out of working with and for others. Financial returns must necessarily be of secondary consideration. Anyone who has the knowledge and ability to make a successful leader can, in all probability, make more money in farming or in the business world. The rural leader must get his pleasure and satisfaction in the fact that he is doing a highly important piece of work for a worthy cause. Rural leadership is a big job and takes a man with knowledge, adaptability, tact, persistence, patience and vision to handle it.

The 1920 Junior Prom will be held April 30.

To learn never to waste our time is perhaps one of the most difficult virtues to acquire.

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The PURDUE AGRICULTURIST



APRIL, 1920



Vol. 14 No. 7

Could you work on a diet of lettuce, spinach and water?



Mrs. Cow Says:

I've turned the tables on the boss. By the time he gets through with the diet I've laid out for him, he'll know why he was disappointed in my milk production last July and August.

Certainly not. Neither can a cow hold up a heavy milk yield on grass alone. Spring grass and spring weather do increase a cow's milk flow, of course, but that is because grass is stimulating, and spurs the milk-making organs to greater activity. When a cow's chief business was nourishing a calf, this proved a wise provision of nature. It gave the calf a good supply when it needed it, and it made no difference if the cow did suddenly fall off later in the season.

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On grass alone, the cow gives up more nourishment in her milk than she receives in her feed. She makes up the deficiency by drawing upon the protein, carbohydrate and mineral elements in her own body. As her bodily supply is diminished she becomes thin and weak. The minerals taken from her bones, leaves them soft. This is why many good cows become sway-backed, if not properly fed.

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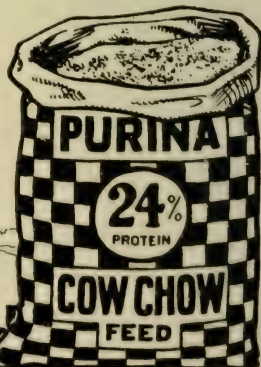
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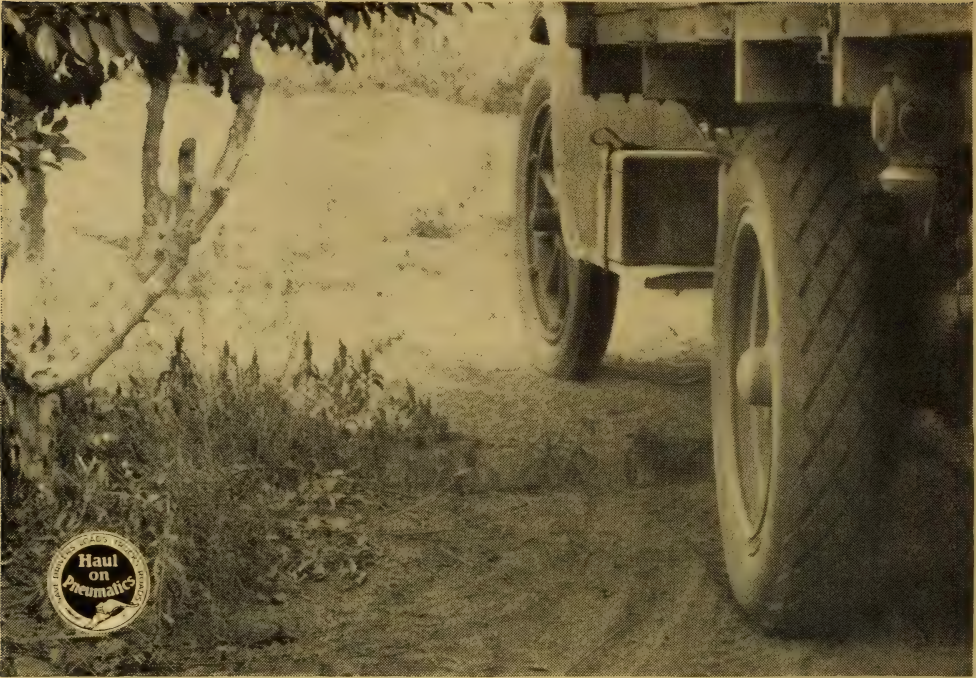
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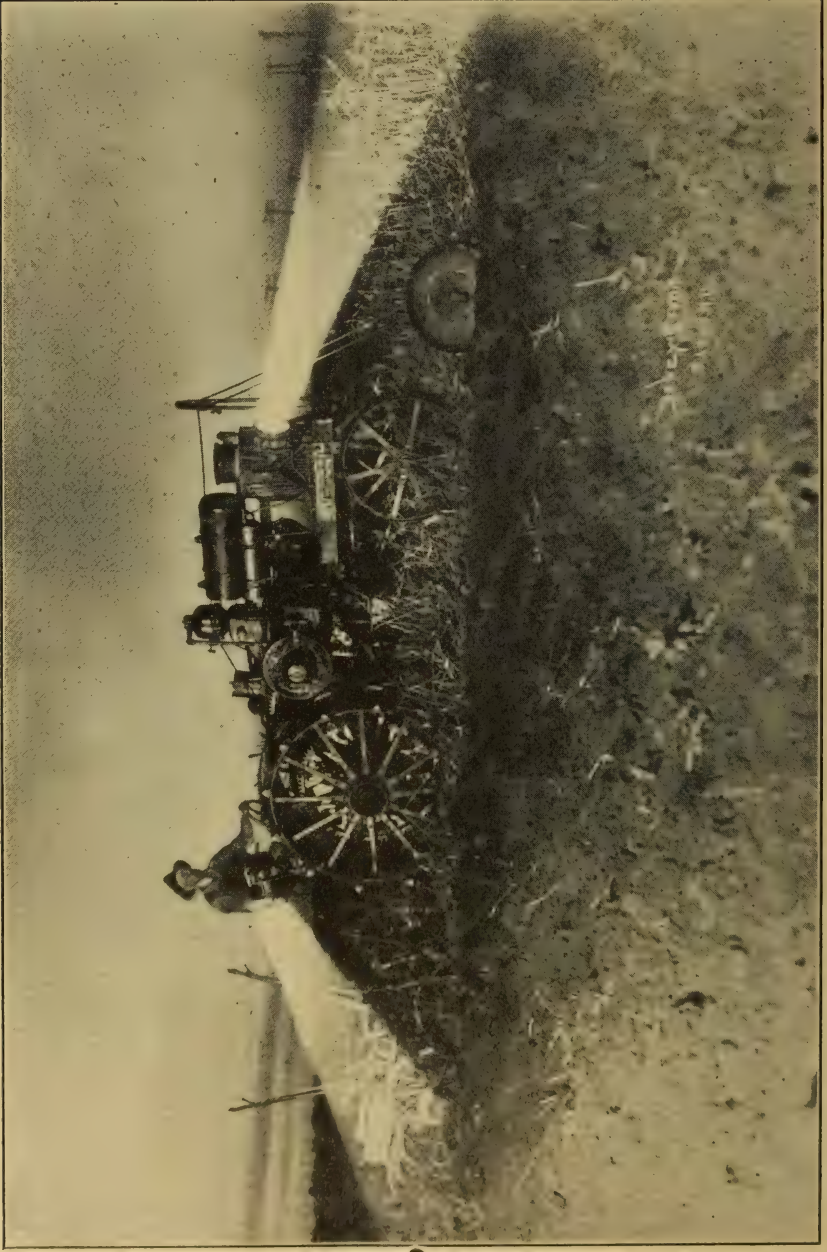
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The tractor has not replaced the horse in Indiana, although the tractor is proving its worth.

THE PURDUE AGRICULTURIST

VOLUME XVI

APRIL, 1920

NUMBER 7

Problems that Confront the Beginner in Founding and Maintaining a Purebred Herd of Livestock

By Prof. B. E. Pontius.

EACH year there are a large number of young men graduating from our Agricultural colleges. Some of them go back to the farm expecting to work out some of the ideas they have obtained while in college. The fact that livestock is found on the great majority of farms and because they are such a necessary part of most farms, we may expect that many of these young men will be interested in, and will engage in their production as a part of their farm operations. Some of them expect to become breeders of pure-bred animals, and it is to these men that this article is particularly addressed. What I have to offer, I trust will be applicable and informative to any who have not had a college training.

These young men have been taught that profitable livestock production is possible only with animals that have at least some merit. They know that the good ones have the greatest possibilities and offer the greatest opportunities. Their ambitions are to some day be the owners of high class herds or flocks of their own breeding. This is an excellent goal to work toward but not an easy one to reach. There are many problems to solve and many obstacles to overcome and it is only by hard work and sheer persistency that success may be attained. It is the purpose of the writer to suggest some of the more important things that should be considered by the beginner in establishing a herd or flock.

To succeed, the embryo breeder must be thoroughly interested in his project, ambitious, intelligent, patient, and have a love for his animals. Every herd of merit is the result of someone's thought and skill, plus hard work. The kind of animals a man breeds and develops are a measure of his capability. The task is

big enough to tax the ability and resourcefulness of the very best. Real constructive breeding is accomplished only by a comparatively few men and the opportunities for it are unlimited.

It is very important that a problem of such magnitude be properly attacked at the start. A workable plan should be thought out that will serve as a guide while the herd is being built. This should be constructed in such a way that if it becomes necessary to alter it, as is very likely to be the case, it can be done without abandoning the original plan. It is impossible to accomplish any measure of success by "hit and miss" methods, and for this reason it is very important that the beginner have something definite in mind that will help to guide him in his decisions. Indeed he must be guided by the evidence that comes to him from generation to generation, for proper matings can only be determined in this way; but this need not alter the general scheme.

Experience has taught us that it is best for the average man to begin on a small scale. In many cases it is best to begin with a herd of grade stock, and after demonstrating that he can successfully develop and manage them, he is justified in seeking the richer blood. A few well-bred females can be brought into the herd and kept with the grades until their progeny is sufficient to replace the grades. This is an easy and safe way to get a start in pure-bred animals. If there is sufficient capital available, it is an easy matter to buy animals of good breeding and individuality and assemble them into a herd. But there is nothing constructive about this method unless you can produce from them progeny of greater merit than they have.

In the majority of assembled herds so much blood of a different character

is brought together that the results are more often negative than positive. The herds of real merit the world over have not been made in this way; they have been made by using blood of like character obtained by mating animals that were not wholly unrelated. There are many herds whose individuals are all descendents of one noted female and the majority of them are a credit to their ancestry. To get the best results it is necessary to select animals from breed families that are known to 'nick' well together. Herds that are developed by line breeding have more good animals as a rule than are found where out-crossing has been practiced. Out-crossing is very beneficial if the blood "nicks" well.

Which breed should be selected? This should not be difficult to decide. With a knowledge of the quality and adaptability of the various improved breeds, and knowing which of them is predominant and most popular in the locality in question, the decision can easily be made. There are many advantages of promoting and developing just one breed of a given class of livestock in a community and they are so evident that they need not be mentioned here. In case the community in question is in a locality where there is no leading breed, then you may select the one you like best providing, it is adapted to your particular conditions. It is good policy, however, to sense the opinion of your neighbors, for if you select a breed the majority have a liking for, you will have a ready market for your surplus stock.

After the breed has been selected, then the study of the breed's blood-lines should be begun. No one can intelligently select breeding animals without knowing something of their pedigrees. Choice blood has had its origin in some choice individual, or perhaps individuals; and these were choice because of their type and ability to respond to feed, both of which are due to heredity. Choice individuals generally represent breed families or strains that have been noted for their productivity, and it is to this source that the intelligent breeder looks for his seed stock. But no animal should be selected for breeding purposes just because he or she has a certain family name.

Selection should be based on: (1) type, (2) individuality, (3) ancestry, and (4) performance.

It must be remembered that an animal is not necessarily good just because it is pure-bred and registered. Unfortunately it is true that there are many poor pure-bred animals but this need not discourage the novice; it ought to encourage him because it suggests room for improvement. It is only fair, however, to say that the very best producing animals of every class are pure-bred. High producing grade animals have inherited their productive power from the blood of the breed from which they take their name. I do not wish to convey the idea that I believe every man who keeps livestock should have pure-bred animals. I do not think so. I am simply offering argument to show that the very best blood is found in the pure strains of our various breeds and therein lies our hope for future improvement. To safeguard the beginner from selecting inferior stuff it is a good plan for him to take into his confidence some good reliable breeder of the breed which he has chosen who can give him sound advice.

The feeding and care of pure-bred animals is very important. In fact the success of the venture depends quite largely on these two factors. Young stock must be well fed to develop properly; in fact it is good feeding that develops capacity which in turn gives them great productivity. It requires more feed to keep them doing well than it does to maintain grades or scrubs but they return more for the feed they eat because they have power to convert larger amounts into milk, beef, pork, and mutton. Much skill is required on the part of the feeder to get them to eat large amounts of feed and to keep them on feed. Such is possessed by relatively few men.

Successful business ventures depend to quite an extent on the respect of the public, so it is with the breeder of pure-bred livestock. He must have the respect of his fellow breeders, and beginners should set to work to gain their respect. This can be accomplished by friendly intercourse and cooperation; by results with the herd or flock; and by honest dealings. If he makes a success of producing ani-

imals of merit he soon will gain a reputation as a breeder of good stuff. Reputation is a valuable asset in selling breeding animals, and if it is maintained there will be no difficulty in disposing of surplus stock. It may be necessary to do some advertising so others may know when and what there is for sale. Most good breeders of pedigreed livestock be-

lieve advertising is essential and profitable. They carry considerable space in the livestock papers and they show at county and other important livestock shows.

Breeding good animals is a fascinating business and it offers reward to those who withstand the disappointments and who persevere.

Rearing the Baby Chicks

By H. H. Kauffman, '22.

ONE of the basic principles of rearing baby chicks successfully is to have strong, healthy and vigorous stock. However, in spite of health and vigor, personal care and attention is required from the time they are hatched until they are left to forage for themselves on free range.

The type of house and brooder must be determined by the local conditions, although of late years the colony houses, heated by coal brooder stoves, seem to be the most practical for the average farm flock and commercial plant. The houses and brooders should be thoroughly cleaned and disinfected with a three per cent. creolin solution. Some poultrymen prefer crude oil to creolin. Although crude oil is equally as effective as creolin in destroying lice and mites, it is not as effective in destroying disease germs.

The floors of the houses should be covered with a one-half inch layer of clean, dry sand. Over this fine cut clover or alfalfa should be scattered. About two days before the chicks are hatched the houses should be heated so as to attain an efficient and constant temperature.

The chicks should be left in the incubator for at least thirty-six hours after hatching, to allow them to dry off and gain strength. At no time should any weaklings be put with a large flock, for they are sure to be run over and killed by the stronger ones. The mortality of the weaklings can be greatly decreased by putting them in a pen by themselves, or by putting fifty or seventy-five in a small circular hover. However, with the colony brooder five hundred chicks can be successfully kept in one flock.

The following temperatures on the floor with the level of the chicks have been found to be the best: From 98 to 100 degrees the first week; 94 to 98 degrees the second week; 90 to 94 degrees the third week, and 80 to 85 degrees the fourth week. The best principle is to keep the brooder fairly warm and allow the chicks to move away from the heat if they so desire. A high temperature has a tendency to decrease the vitality and vigor, and cause digestive disorders, which will kill many chicks. On the other hand too low a temperature will cause them to chill and crowd. A ten per cent loss in one night is nothing unusual for chicks when several days or weeks old. A uniform temperature starting at 100 degrees and very gradually becoming cooler until 80 degrees is attained, when the chicks are four weeks old, is best.

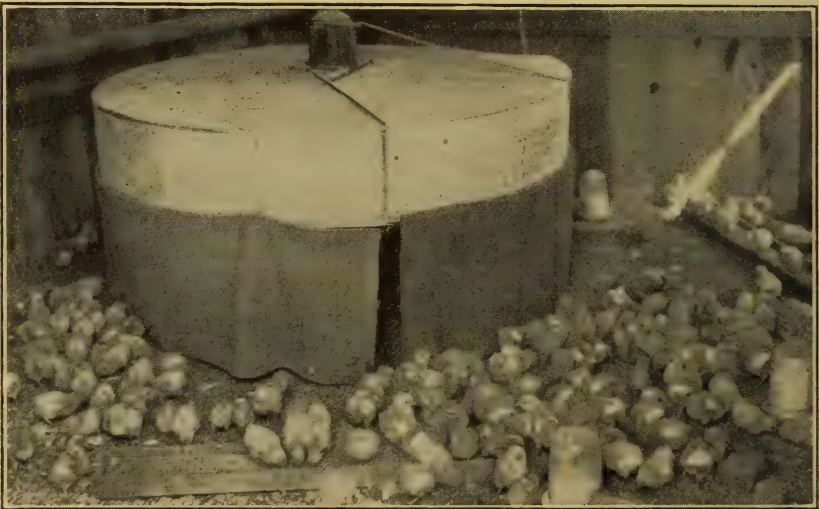
One of the most common mistakes of the inexperienced man is to overfeed or feed too young. Chicks should not be fed before they are sixty hours old. The first day's feeding should be sour milk. This should be fed about five times a day at regular intervals. As soon as the whole flock seems satisfied for that time, the milk should be removed until the next feeding. The next day they should be given pin head or rolled oats, three feedings will suffice, and only as much as will be consumed at the feeding time. For the remainder of the week they should have a good fine grain ration, scattered in the litter about five times a day. The following ration was tried by the New Jersey Experiment Station and found to be very satisfactory:

Cracked corn	20 lbs.
Fine cracked wheat	25 lbs.
Grit	5 lbs.
Pinhead oatmeal	5 lbs.

In addition to this, sprouted oats or green grass should be fed, and once a day hard boiled eggs in small amounts. When they are about one week old wheat bran should be placed before them in small hoppers, and the noon feeding of grain can be omitted. From the third week until they are put on range the following ground grain should be added to the wheat bran, to constitute

chicks in too high a temperature, and a lack of fresh air.

The heaviest loss in brooding chicks may usually be attributed to one of the four following causes: First, overheating or running the brooder at too high a temperature and keeping the chicks confined to the heat, which results in delicate hot-house birds without vigor, which are very susceptible to severe diarrhoea. Second, chilling or keeping at such a low temperature that the birds crowd together to keep warm; many may die of suffocation, while others are gen-



A colony brooder—practical and economical.

the dry mash, which should be kept before them at all times. The mash should consist of:

Wheat bran	50 lbs.
Corn meal	5 lbs.
Sifted ground oats	5 lbs.
Meat scrap	2 lbs.

From the time they are two weeks old until they begin to forage, the grain feed can be fed three times a day, at morning, noon and night. If available, sour milk kept before them at all times, is good.

From the time the chicks are a few days old they should be encouraged to go out of doors as much as possible; the fresh air will make them grow more rapidly. Poor results in artificial brooding are oftentimes due to keeping the

erally weakened in constitution. Third, young chicks have a tendency to pick at each other and inflict losses. This is known as cannibalism. It can be checked by giving them exercise and feeding meat scraps and ground bone in the dry mash. Fourth, many brooder chicks are lost as the result of infectious diseases. Contagious white diarrhoea may be inherited from the mother hen and is quickly communicated from one bird to the other. Bacillary diarrhoea (*Bacterium Pullorum*) may be checked by giving an abundance of sour milk. But when the disease is in the flock it is better to get healthy breeding stock.

When the chicks are about five weeks old the temperature should be gradually

(Continued on page 432)

Household Accounts

By Inez Richardson,

Division of Home Economics.

(This is the third of three articles on Farm Accounting, published monthly in the Agriculturist.)

THE majority of women have never looked upon the matter of "the business of the household" very seriously. Few have had training in the keeping of household accounts, and most have looked upon it as an additional burden.

The advance in the cost of almost all commodities has brought in the minds of women that they must plan much more carefully than hitherto, that they must know more about the value of articles purchased, and must use to better advantage the things needed in the household. They are beginning to appreciate the fact that the same fundamental principles must be applied in carrying on the business of the home as are used by industrial or commercial firms.

The housewife has been brought face to face with the fact that she handles a large part of the family income. To earn one's maximum income and to make that income yield its utmost is thrift. The size of the income is not the only factor that determines what can be bought in the way of necessities, comforts and security for the future. The way the income is used also has a big influence.

A budget is an organized plan for using the income, a guide for good thrifty living. By applying the budget plan to the income before spending it, the same kind of advantage is derived as from adjusting all parts of the pattern to the cloth before cutting a garment from it. Difficulties may be foreseen and decisions made in advance as to what temporary sacrifices are desirable in order that the greatest benefits may be obtained. It is not fair to use the bulk of the income for one phase of living and neglect another.

An efficient budget cannot be made unless preceded by a survey of the income and ordinary expenditures. The Household Account takes care of this proposition. It not only serves as a guide in making the budget, but it becomes a

check on this system of adjusting the expenditure of the income.

The story told by the household account book in regard to what a desirable budget is will vary greatly, this variance depending upon such factors as (1) the certainty and size of the income; (2) the size and habits of the family; (3) the place of habitation.

No family can use a ready made budget to good advantage, but should spend much care and consideration in making a study of the needs of the family. Many families fail to live well because they do not divide the income to the best advantage.

Many housewives in the country do not keep household records because a large quantity of the food used is produced on the farm. This is a great mistake. If the country housewife realizes that she is a business executive in her home she will readily see that she should consider these products used from the farm as a part of the family income. In keeping her accounts it would be both interesting and profitable to keep two records, one of the expenditure for various commodities, and the other that of the products from the farm that are used as food.

The Home Economics Division of the Purdue Extension Department has prepared a Household Account Book which is accompanied by a card for the tabulation each month of the materials derived from the farm for home use.

The expenditures of the family are tabulated under five headings according to this publication.

1. Food, under which are found the headings: Groceries, Meats, Milk, Dairy Products, Poultry, and Eggs.

2. Clothing. Clothing will include not only the actual garments or material purchased, but also the cost of making, repairing, etc. It would probably also include any cleaning of garments which would not come under laundry.

3. Shelter. Shelter will include anything connected with the house and its

upkeep. Rent, if house is not owned. When the house is owned, this column includes such items as taxes, payments, insurance, repairs, improvements.

4. Operating Expenses. All items which make up the "running expenses" of the home should be listed under this general heading. Example—telephone, rent, fuel, lights, water, ice, etc.

Household Supplies would include household linens, furnishings, such articles as soap, washing powders, labor saving devices, postage, ink, kitchen equipment, etc.

Help would include expense for service of any kind except items coming under clothing, shelter, health; e. g., washing, ironing, cleaning, care of children, raking yard, care of garden.

Health would include services of the doctor, dentist or nurse. Medicines, tooth brushes, etc., could well come here.

Some people might prefer to put such expenses under "Household Supplies."

5. Advancement. Such items as school or college tuition or fees, books, magazines, newspapers, special lessons or instructions could be included under advancement. Travel would probably come under "Recreation," which is included as a subdivision of advancement.

"Social Service," another subdivision, includes expenditure for charity, for community projects such as a library, farm organization, etc., and for organizations such as the Red Cross, Y. M. C. A., etc.

Investments, bonds, savings accounts, insurance (life and health), come under "Savings."

Those who have given the matter consideration agree that "Spending money wisely is the greatest test of your ability to manage the affairs of your home." Household accounts help greatly in securing these wise expenditures.

The Root Rot of Corn

By R. R. Calvert, '20.

PROBABLY no disease attacking the corn has been so little known of, as has been the corn root rot. It has been only in the last year or so that

ing the last year or year and a half, the disease has been pretty thoroughly studied and a great deal of information concerning the characteristics of the dis-



Plate, showing how corn root rot disease affects the joints of cornstalks. It is identical with the scab of wheat, from which it may be distributed.

the importance of this disease has been fully realized and that any work worthy of mention had been done. However dur-

ease has been ascertained. Professor G. N. Hoffer, of the Purdue Agricultural Experiment Station, cooperating with

Mr. Hobart, of the Funk Bros.' Seed Co., has contributed the most of the information we have of this disease through their diligent study of it during the past few months.

In a recent survey made by the Bureau of Plant Industry, United States Department of Agriculture, the extent of the disease, the damage done and the percentage of the crop affected was determined. Some figures will be given which I have

stalk and leaves, rotted primary and secondary roots and we may find stunted plants due in all probability to the presence of the root rot organism (*Fusarium* Spp.) All of the above mentioned symptoms are found associated with the disease but all may not occur in one locality, as for instance the principle symptoms found in Indiana by the survey were stunted and barren plants, but down stalks were also quite commonly found.



Selecting seed from ear-to-row test plots to insure disease-free seed corn.

obtained from the plant disease survey showing the relative importance of the disease, characteristics and the different methods of identification of the disease. There were twenty-seven counties visited in Indiana by the survey, which comprised approximately an acreage of 1,987 in 112 fields. The estimated per cent of infected plants on this area was 5%, seemingly rather low percentage, and probably making us think of the damage done as negligible, however, as a matter of fact when figuring 5% of the total corn crop of the state being affected and lost due to this disease the profit lost is fully realized. We are also inclined to think the damage done by the disease may increase if proper precautions are not taken against it.

There are a number of ways by which the disease may be identified, such as the presence of barren stalks, down stalks, wilted or withered appearance of the

The control of the disease consists of a preventive measure rather than a cure such as we have for the treatment of oats, wheat, etc., for smut and weevil respectively. It is of paramount importance, in the successful control of this disease, that every grain planted be tested. The testing of the seed corn should be begun sometime before the planting date so as to be given an opportunity to select only that corn which has shown to be disease free after properly germinating it.

The reading of the germination should consist of noting the vitality of each of the ten grain samples taken from the ear, the presence of any rot in the embryo, on the primary or secondary roots on any other characteristics, as for instance an abnormally large root system, should be noted.

Better "wear out" than "rust out."

Better Quality in Dairy Products

By C. F. Sanders, '20.

FRESH normal milk is one of the most important of human foods, but no article of diet is more susceptible to undesirable changes, due to the delicate nature of the milk itself and to the conditions naturally surrounding its production and handling. These injurious changes which commonly occur in milk are of two kinds; absorbed taints and odors, and changes due to micro-organisms. Although the absorption of foreign odors is not at all uncommon, this source of contamination in the majority of cases may be traced directly to the growth of micro-organisms. Changes of this sort include the phenomena of souring and curdling, the so-called sweet curdling, ropy or slimy milk, bitter flavors, gassy milk and a large variety of changes usually known as barny or cowy odors. Milk itself is an ideal cultural medium for the growth of bacteria and hence if handled without a certain amount of care it will soon be unfit for human consumption. Not only does the milk contain the needed food elements, but being in a liquid form, they are easily available for the use of the micro-organism. If milk could be kept free from micro-organisms it might be kept for several months without showing any perceptible change in appearance or taste.

During the winter months when the low temperature of the atmosphere to some extent prevents the development of bacteria, in the air and on the surface of the various pails, cans and machinery that comes in contact with the milk, the chances of contamination are greatly reduced. With the approach of the warm summer months methods should be adopted to prevent in as far as is possible the development of these bacteria.

The use of preservatives in milk cannot be recommended; first because it is illegal and second no good practical preservative has been developed except possibly hydrogen peroxide and this is not at present very practical due to the expense and the difficulty of handling. Therefore the problem resolves itself around the method of handling and car-

ing for the milk from the time it leaves the cows' udder until it has been delivered in good condition to the milk dealer or to the consumer.

This problem may also be divided into three phases: 1. By insuring the use of none but healthy cows. 2. By protecting the milk as far as possible from external contamination. 3. By maintaining conditions which so far as possible prevent the growth of these bacteria. In this article I shall not attempt to discuss the first phase but shall attempt only to handle the second and third.

The cow stable should be so arranged as to insure the free circulation of air. It is much better to have the barn on high ground from which there is ready drainage than on low ground. Both air and light in the stables are necessary for the best results. This, however, is a permanent asset of the farm and is only casually mentioned here. The cleanliness of the stable is a matter of utmost importance. The habits of the cow and the nature of the manure are such as to render a high state of cleanliness very difficult. But the dairyman should understand that all accumulations of manure and other filth is a direct detriment to the quality of the milk. The cleaner the stable the better the result. Attention should be given to the dust, cobwebs and hay that may be clinging to the ceilings of the barn, for here is found one of the greatest source of contamination in milk. Whitewashing will materially help as a disinfectant and will also tend to make the stable light and clean.

Very frequently the milker himself may be an important source of contamination. The cleanliness of his clothes and hands are matters of great importance, or if he brushes against the cow, the dust thus dislodged may carry into the milk large numbers of micro-organisms. By no means should a person suffering from a contagious disease be allowed to help in the handling of the milk.

No simple procedure is more efficient than moistening the udder just before

downing the milk in reducing the bacterial contamination. The value of this practice by moistening the udder with a damp cloth or sponge before milking is greater than one would imagine. Its purpose is not only to prevent the fall of dust and other foreign matter into the pail, but also to cleanse the udder. The udder should not be left wet but simply damp. Contrary to the common opinion that brushing the udder is a sanitary measure this process tends to increase the number of bacteria in the air, from where it easily falls into the open pail. The result is that there is an actual increase in the number of bacteria where this method has been practiced.

All utensils which are used in connection with the milk should be so constructed that there are no cracks or crevices in which the milk can accumulate and from which it is not easily washed. A milk pail with an open seam may be the cause of serious trouble in the dairy. The dairy utensils should be simple in construction, and so made that they may be thoroughly cleansed with ease and made of such material that they may be thoroughly sterilized either with water that is actually boiling or with steam. The kind of pail to be used is not the question here, but the pail with as small an opening as possible is preferable. In this way most of the dirt is excluded and the milk as a rule will be decidedly better in quality. Every dairyman should recognize that if the proper utensils are used this is one of the easiest, cheapest and most efficient means at his disposal for improving the character of his milk. It is necessary to use them intelligently, however, for a careless milker can obtain as bad results from the use of proper utensils as from the use of obsolete types.

Knowing all this and practicing care in every detail will be of no avail if the milk is not kept cool from the milking until the time of consumption except in the case of pasteurizing, and in this case the milk is heated between 140 and 160 degrees and held at these temperatures for from thirty seconds to half an hour, but it is then immediately cooled to about 45 degrees. In this nearly all of the bacteria are killed and the immediate cool-

ing prevents the further development of those not killed. With the greatest of care during the summer months it is impossible to exclude all of the bacteria. But with the number reduced to a minimum by careful handling the next problem is to prevent their development and growth. The only practical way to do this is to keep the milk as cool as possible after it has been handled in a thoroughly sanitary way. If the milk or cream is kept on the farm for any length of time the cans should be placed in a cool place, preferable in or near constantly cool water. In no case should the cans be left sitting in the sun. If cream is shipped to a creamery or centralizing station the cans should not be filled. This is to allow for what is commonly called "boiling," but in reality it is the work of bacteria commonly known as "*Bacterium aerogenes*" or gas forming bacteria. These bacteria produce gasses from the carbohydrates found in the cream which causes the apparent boiling and is a source of a great loss during the summer months. It is not an uncommon sight at stations where creameries are located to see the floor of the station covered with cream that has boiled over the tops of the cans. Someone must suffer this loss and as a rule it is the farmer, hence if this loss can be prevented by a little care the result will prove more than satisfactory.

To the milk producer this does not apply to any great degree. The problem in this case is to deliver the milk to the consumer or to the milk dealer before it begins to sour. The method of doing this is exactly the same as with cream. Keep the milk cool and clean and deliver as quickly as possible.

PRESERVE THE MARKET BASKET.

A good willow market basket could be bought a few years ago for a dollar. We all know what a nice one costs now. It pays to keep the old basket in good condition as long as possible. It will help to do this by applying a coat of stain finish, obtainable at any paint store. This makes it weather proof.

Concrete and Its Uses on the Farm

By R. M. Kincaid, '23.

CONCRETE is fast becoming one of the most universal building substance for the farm. From this all farmers can see that it behooves them to learn all about it they can.

Concrete is practical, cheap and durable for any farm. Some farmers say it is too costly, but there is no other building substance which will last longer. That fact alone makes it valuable. Anything built of concrete is put up for many years and it always holds its beauty. Every farmer admires the person whose farm is well improved with concrete posts, walks or porches. Well constructed concrete posts will not rot nor will the staples pull out. With just a little time and money the corner post can be so constructed that the fence may be tightened from time to time.

The silo may be built of concrete. Since the silo is a great asset on the farm make it permanent. Concrete fills every need for a good durable silo. A silo made of concrete is air tight, water tight, rot proof and fire proof. Every one knows that a silo must be air tight if we are to keep the silage in good condition. By being water tight the corn juices which keep the ensilage green and tender are kept in. A concrete silo can be made smooth on the inside, thus allowing no places for the silage to catch and keep from packing. Rats cannot work through concrete so the ensilage is kept from spoiling. Ensilage keeps better if kept at an even temperature. Concrete is a non-conductor, therefore the ensilage is kept good, for nature provides the necessary heat. Concrete is non-combustible, therefore the ensilage will be kept even if the barn should burn. Concrete silos are not attacked by the juices coming from the silage and they do not rot nor shrink. There are no hoops on a concrete silo to tighten and the silo will not slip on the foundation.

A feeding floor made of concrete is durable and will stand the weather. These floors save time, money and labor. They are easily cleaned and disinfected. These floors do not soak up the water thus leav-

ing no place for germs of cholera. The saving in grain alone will soon pay for the cost of construction.

These floors are best constructed by digging a trench which is filled with grouting and packing underneath which are cinders or sand. If they are subjected only to feeding four inches is thick enough but where loads will pass over them they should be six inches thick. The trench prevents rats working under and also the wallowing of hogs. The trench should be from twelve to eighteen inches deep.

Concrete porches and walks improve the appearance of a farm a great deal. Concrete porches as we all know are pretty expensive but the walks are not. After the position of the walks has been selected the next process is building them.

If the foundation is clay soil, tile should be placed at short intervals, leading into basins of rock, brick-bats or anything that will allow the water to escape. If this isn't done the soil becomes full of water and freezes. Since water expands when frozen the walks will be heaved up. Broken stone, brickbats, broken tile, pebbles, cinders or other material may be used for the foundation. Ashes should never be used for this purpose as they pack together. The foundation should be well tamped and level. If it is sixteen inches deep it is better. Fill this trench with the stones or other material for about twelve inches, then rough concrete or one course. The finish coat must be kept wet until thoroughly hard and set or the walk will scale and become chalky.

Following is a table showing the quantity of material to use for each mixture.

A 1:2:3 mixture is the best for one-course walks and barnyard pavements, concrete floors, posts, sills and lintels without mortar surface, watering troughs and tanks.

A 1:2½:4 mixture is best for silo walks, grain bins, coal bins, elevators, walks or pits subjected to considerable moisture, manure pits, dipping vats or wallows.

Quantities of Materials Required for Various Mixtures of Mortar and Concrete

Mixed Materials for One Bag each				Resulting Volume in Cubic Feet		Quantities of Cement, Sand and Pebbles or Stone required for one cubic yard of compacted Mortar or Concrete				
	Cement in Sacks	Sand cubic feet	Pebbles or Stone cu. ft.	Mortar	Concrete	Cement in Sacks	Sand		Stone or Pebbles	
							Cu. ft.	Cu. yd.	Cu. ft.	Cu. yd.
1:1½	1	1.5		1.75		15.5	23.2	.86		
1:2	1	2.0		2.1		12.8	25.6	.95		
1:2½	1	2.5		2.5		11.0	27.5	1.02		
1:3	1	3.0		2.8		9.6	28.8	1.07		
1:2:3	1	2.0	3.0		3.9	7.0	14.0	.52	21.0	.78
1:2:4	1	2.0	4.0		4.5	6.0	12.0	.44	24.0	.89
1:2½:4	1	2.5	4.0		4.8	5.6	14.0	.52	22.4	.83
1:2½:5	1	2.5	5.0		5.4	5.0	12.5	.46	25.0	.92
1:3:6	1	3.0	6.0		6.4	4.2	12.6	.47	25.2	.94

A 1:2½:5 mixture is best for walls above ground that are to have a stucco finish. For the base of two-course side-walks, feeding floors, barnyard pavements or two-course plain concrete floors, abutments, basement walls and foundations where water-tightness is not essential or for foundations for small engines.

A 1:1½ mixture for plastering the inside walls of silos, tanks, or for facing foundation walls to give added water-tightness.

A 1:2 mixture for stucco work, facing

blocks or the wearing course of two-course walks, floors subjected only to light loads or barnyard pavements.

To have good concrete the proportions must be accurate and the mixing thoroughly done before any water is added. It is well to determine the amount of materials used for the first batch which will give the required consistency and use the same amount each time. Concrete should be wet when placed in the forms so that water will rise to the top, upon being tamped moderately.

SUMMARY OF PROJECT RESULTS.

Note.—This is a summary of the club and project work of Indiana for the year 1919. A total of 851 organized clubs with an enrollment of 27,275 members shows that Indiana recognizes the value of organization.

Project or Club	Clubs Organized	Enroll- ment	Members Reporting	Value of Products	Cost of Production	Net Profit
Corn -----	56	901	626	\$119,115.00	\$ 57,347.00	\$ 61,768.00
Potato -----	14	130	76	2,358.40	1,167.41	1,190.99
Garden -----	220	19,674	13,989	124,631.40	39,643.20	84,988.20
Poultry -----	62	772	540	10,342.28	4,432.12	5,910.16
Beef Calf -----	7	90	68	8,397.50	6,950.20	1,447.30
Pork -----	120	996	689	34,732.76	20,103.21	14,629.55
Dairy Calf -----	8	158	96	13,186.86	2,546.10	10,640.76
Sheep -----	9	101	73	5,609.91	4,123.12	1,486.79
Bread -----	21	145	96	3,790.00	1,747.00	2,043.00
Sewing -----	73	878	568	7,894.20	5,349.10	2,545.10
Pig Breeding -----	36	726	513	29,258.73	10,462.31	18,796.42
Beef Calf -----	6	210	133	19,623.76	9,867.31	9,756.45
Egg. Prod. -----	7	130	90	4,367.42	1,632.21	2,735.21
Other Projects* -----	96	1,280	892	14,321.30	7,638.30	6,683.00
Canning -----	91	852	556	15,476.00	9,206.00	6,270.00
Sow and Litter -----	25	230	156	22,641.62	6,768.42	15,873.20
Totals -----	851	27,275	19,161	\$435,747.14	\$188,983.01	\$246,764.13

* Includes home keeping, cottage cheese, farm crops, farm management, rabbit and tomato clubs.

THE PURDUE AGRICULTURIST

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

INDIANA ROADS.

With 42 per cent of the 74,000 miles of roads in Indiana improved, this state leads all others in the country in the number of miles of improved roads, according to data compiled by the civil engineering department of Purdue University. One other state, Massachusetts, leads in the percentage column with 45½, but that state has only 18,000 miles of roads, a fourth of the number in the Hoosier state.

Michigan, with practically the same mileage as Indiana, has only 10½ per cent of its roads surfaced. Illinois, with 96,000 miles has but 12 per cent surfaced; Kentucky, with 58,000 miles has 21½ per cent improved; Ohio, with 86,000 has 35 per cent improved.

Estimates of the United States Department of Good Roads in 1914 showed 2,500,000 miles of roads in the United States. Recent figures gathered from statistical reports by Prof. C. C. Albright, of the engineering staff, show that 450,000 miles should be improved, but at the present rate this work is being done, it would take 30 years to complete the job, which is less than one-half as rapidly as the work should be done in order to take care of the ever increasing traffic properly.

CONSISTENT ADVERTISING PAYS.

An examination of advertisements in agricultural papers and magazines shows very plainly that the farmers are beginning to realize the value of consistent advertising of their products. A number of local farm papers report that farmers in their communities are paying for a definite space throughout the year for the advertising of their products.

Many farmers report that advertising has made it possible for them to secure better prices when they produced superior products. They have also been able to make hundreds of new friends and acquaintances. Well-worded letter-heads are also becoming a popular and profitable sort of advertising. A letter-head to be most effective contains the name of the farm, its product, the farmer's name and a short, snappy, easily remembered slogan.

When you advertise remember that it is the consistent attractive ad. that is worth most in the long run. As competition becomes more strenuous the farmer must follow the lead of other industries and use every possible means to dispose of his products at the highest possible price. Advertising is the answer.

When days go wrong, remember they aren't self-starters.

THE GARDEN.

Now is a good time to plan for that home garden. Much time and money can be saved by laying out a definite plan for your garden, now during the dull days. Work out a plan that incorporates your individual taste. On planning your garden it must be kept in mind that the supply of vegetables should be continuous throughout the season and the assortment as large as circumstances will permit. Time, both in planting and tending, can be saved by grouping the plants according to cultural characteristics. Planting should begin at one side of the garden and proceed across the plot as the season advances. Have those crops which occupy the land about the same length of time, planted together. Then after the early maturing crops are harvested, it will be possible to clear a strip of land for other late crops as desired. The actual planting of the garden is a small matter, provided a definite plan has previously been made, so that no time is lost in deciding which vegetable to plant first, where to plant it or how much to plant.

THE PURDUE BAND.

The taking of the Purdue Military Band to Atlantic City next June for the International Convention of the Rotary Club marks an epoch in history. For years our band has enjoyed the reputation of being "the best college band in the Middle West," but now it will no doubt take on a national reputation. Not only is this a splendid recommendation of the excellence of the band, but it will also be the means of advertising the University.

After the stay at Atlantic City, the band is to make a short tour of some eastern cities, including Buffalo, Cleveland, New York, Washington, Pittsburgh, Philadelphia, Detroit and finally coming back to Chicago. At Chicago they are to appear as a part of the Lafayette, Ind., delegation to the National Convention of the Elks. This is an exceptional opportunity for bringing Purdue before the public and much is expected to result from the tour.

PREPARATION OF THE SEED BED.

In preparing the seed bed for corn, it should be plowed at least six to eight inches deep. It should be worked over with a disk, harrow and culti-packer or such implements that are available for use that will bring about a mellow condition of the soil. It should be compact enough, however, to be able to support the plant erect. If it is plowed six to eight inches deep and is mellow, it will enable the roots of the corn to penetrate deeper. In this way it helps to support the plant better and at the same time permits the root system to spread farther and consequently brings the roots in contact with more plant-food and water. Where weeds, stubbles and especially cornstalks are to be turned under, a very good practice is to cut up the cornstalks with the disk before plowing. In fact this is a very important factor, because when plowed the fine soil particles filter in around the stalks and does not permit the formation of large air spaces that aid in drying out the soil. Disking sometime before plowing will prevent evaporation, so that if plowed later it will be comparatively free from clods. Good plowing saves labor in the preparation of the seed bed. For good plowing the following are necessary:

1. The entire furrow-slice should be cut loose beneath and all turned.
2. The plowing should be done to a certain depth to produce pulverization. For best pulverization plowing should be done five to seven inches deep.
3. The turning under of rubbish is essential to good plowing.
4. The furrow should be kept straight or at least parallel with the middle ridge, as a crooked furrow almost always indicates "cutting and covering" at some point.

The DeKalb County Duroc Breeders' Association has started the year with a strong program of work outlined, is the report of County Agent A. Z. Arehart. The following projects will be started in the near future: A pig club, herd records, plans for a fall fair exhibit, and a tour. A pig club committee has already been appointed.

Trained Leadership in Agriculture

By W. E. Walters, '21.

AGRICULTURAL instruction twenty-five or thirty years ago was considered necessary for only the expert research and experiment station worker. Gradually the demand for knowledge in scientific agriculture has grown. For several years the Agricultural Colleges have flourished, and many men have been trained in the theory of Agricultural science. A large number of these men have become practical, suc-

operation and demand for it by the people, all of which is due principally to the slovenly standards in agricultural teaching. There are many teachers of Agriculture, even in our high schools who have very little or no scientific training and no practical first hand knowledge of Agriculture. There are, at present, instances of young women from the city, graduates of music and art schools, teaching Agriculture in township high schools



The most important factors of any community, "Are you a backer or a slacker?"

cessful farmers, others have given their attention to the advancement of agriculture through the work of experiment stations, and more recently as farmers' advisors, or county agents. But the demand for agricultural instruction in the elementary and high school has been steadily increasing. Now for six years Agriculture has been a required subject in the elementary school curriculum, and an elective subject for high schools. The greatest drawback in our Agricultural instruction program has not been the system, but the lack of interest, co-

of this state. If public education is to be adapted to the real needs of our Indiana farm youths their schools should be supplied with leaders chuck full of knowledge, inspiration and sympathy for Agriculture and its possibilities.

The accepted opinion of present day educators seems to be, that schools in the past have tended to over-emphasize barren facts. The vital, critical force, which is going to change this condition in our rural schools, is the truly Vocational Agriculture teacher, who will struggle to "keep sumpin' doin' all de

time," and establish cooperation between the farmer, the farmer's boy, and himself. Such a teacher will lead the boys and girls to discover things for themselves. As the youths study Agriculture as an applied science, performing home projects and experiments, suggested by the teacher and aided by the cooperation of the whole family, they will create a real liking for agricultural work and a desire to do their best in advancing the

provide for half of the time to be devoted to agricultural studies, and the remaining time to the regular academic work, the study of languages, however, being omitted from their curriculum. There is a movement among leading Agricultural Colleges to remove the language entrance requirement, thus admitting graduates from this new course. Many colleges have already taken favorable action on the measure. This really means that the



Girls win many honors in club contests. A display of Home Economics products that suggests good housekeeping.

industry. There are many instances illustrating the fact that boys may grow up on the farm efficiently assisting their father with the labor, but on becoming a farmer themselves they make a dismal failure and give up the farming business for a job.

The calf feeding, poultry raising, corn growing projects, directed by the vocational leader will not only give the youth a direct motive, an immediate incentive to study and labor but they will give him experience in management and planning, which are prime essentials to the successful farmer.

There are now fifty-two communities in Indiana being aided by the Vocational teacher. Agricultural high schools are being established throughout the country. In these schools the students may elect to take the Agricultural course, which

rural high school of the future, instead of educating for business and professional life in the city the boys away from the farm, will develop them to be better farmers and to live broader, bigger lives in their own community.

The Purdue Egg Show will be held the first week in May. There is a class for you and now is the time to get interested and get your eggs ready.

D. D. Ball, Daviess county agent, co-operating with farmers of that county has made arrangements for eleven ear-to-row corn demonstrations and the men who are to conduct the work have already started testing the seed for these plots. The seed for this work will be tested for freedom from disease as well as for germination qualities.

Teaching Thrift to Boys and Girls

By Agnes Tilson.

Asst. Prof. Vocational Education, Purdue University.

"Thrift is good management of the business of living.

Thrift has four elements:

1. Earning or production.
2. Spending or choosing.
3. Saving or conservation.
4. Investment or accumulation.

Thrift has three qualities:

1. Frugality or carefulness.
2. Economy or good management.
3. Judgment or wise decision.

Thrift yields three products:

1. Security of the state.
2. Prosperity of the community.
3. Sovereignty of the individual."

If we should ask many parents: "What financial training are you giving your children?" no doubt the greater number would say: "Oh my children can spend money enough if they can get it." But are they spending wisely and are they spending all which they can get?

Our observation shows that many adults do not know how to spend their money wisely and still fewer know how to keep it safely or invest it successfully. Charity workers are impressed with the inability of the poor to spend wisely the little money which they have. Rich sons and daughters often spend money accumulated by their fathers in even more foolish ways. It is the middle class that has had the most experience in saving and spending and often these people have paid a high price for their knowledge.

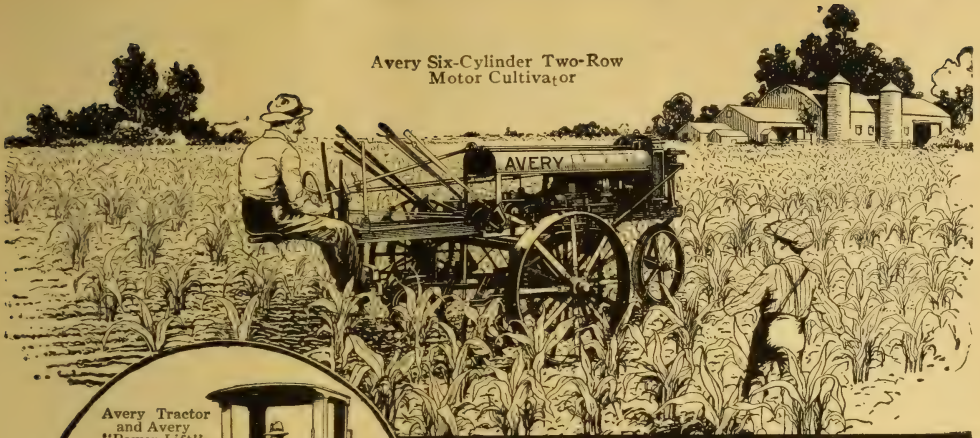
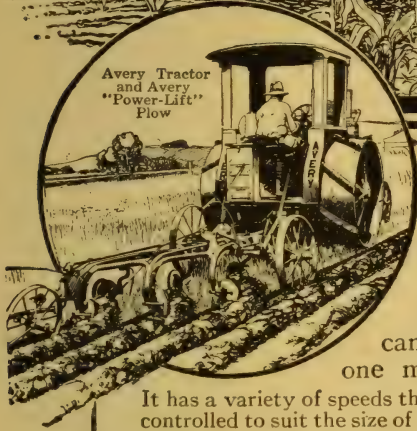
Money has a steadily growing importance in life as civilization progresses. Since our work, our amusement, our culture and our opportunities for social life are at the present time largely dependent on our financial status, it would seem that no one can consider himself prepared for life who has not had some training in solving financial problems. Is it not worth while to consider when and how such training may be given, before the child enters upon the serious work of life where he can learn only by costly experience?

Unfortunately in many homes the

groceries, and most of the necessities and luxuries are ordered by telephone and paid for by check. Car fares, moving pictures and sweets are the main things for which many children see money spent. Too often to many children the bank is the source of money. Neither do they realize that money must be earned by some sort of labor nor that the supply is limited, if certain things are purchased with it others cannot be purchased.

Only through observation and experience of the cost and use of money can children get a true idea of the part it plays in life. Children receive money by two general means, by earning and by gifts. The earning is sometimes done by a fixed sum being given for a definite task which is performed at more or less regular times. At other times the earning is done by running errands or by doing unpleasant tasks. In any case care should be taken that the child is not over paid for "come easy go easy" holds true. Many country boys and girls, largely through the influence of the Boys' and Girls' club work, own and care for some animal or animals, viz: calf, pig, or chickens, then receive part or all of the selling price of the product. Many poor children earn money and are also given money in an unsystematic way. It was found in a study made by United States Child Labor Commission that only one-half the children between the ages of fourteen and sixteen received a regular portion of their income.

Gifts of money to children may be at regular intervals, usually called an allowance, or they may at irregular intervals. Regular allowances are probably given more frequently in rich or well to do homes than in poor ones. In Chicago 35% of the wealthy children in private schools had allowances. Usually when an allowance is given it is to be used in part at least, to satisfy some regular need as: Car fare, books, school supplies or school lunch. When money is given to children in response to asking or teas-

Avery Six-Cylinder Two-Row
Motor CultivatorAvery Tractor
and Avery
"Power-Lift"
Plow

Double Your Cultivation with an Avery Motor Cultivator

With an Avery Motor Cultivator you can cultivate double or more acreage than one man can ordinarily handle with horses.

It has a variety of speeds that can be controlled to suit the size of the growing crop. You can creep along slowly when the crop is small and tender, or you can go as fast as you like when the crop is large. Hot weather and flies can't stop or bother it.

Cultivates Any Row Crop

Avery Motor Cultivators are built in two sizes—a six-cylinder two-row and four-cylinder one-row machine. The two-row is built in widths for crops planted in any width rows. Can also be furnished with various styles of front wheels so that all row crops, such as corn, listed corn, cotton, peas, beans, beets, potatoes, asparagus, tomatoes, etc., can be handled successfully. Can also be furnished with planting attachment for planting such row crops as corn, cotton, peas, beans, etc.

Write for the Avery Catalog and interesting Tractor "Hitch Book." Both books free.

In one locality within a radius of 18 miles, over 100 Avery Motor Cultivators are in use.

Besides cultivating and planting row crops, the Avery Motor Cultivator is also being successfully used for many other kinds of light field and belt work. It is adapted to more kinds of work than any other machine, and is one of the best motor farming machinery investments you can make.

The Avery Line

Also includes tractors for every size farm. Six sizes, 8-16 to 40-80 H. P. with "Draft-Horse" Motors and "Direct-Drive" Transmissions. Two small tractors, Six-Cylinder Model "C" and 5-10 H. P. Model "B." "Self-Lift" Moldboard and Disc Plows, Listers and Grain Drills, "Self-Adjusting" Tractor Disc Harrows. Also, roller bearing Threshers, Silo Fillers, etc.

AVERY COMPANY

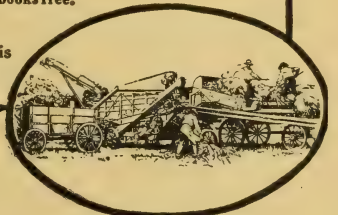
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Peoria, Illinois

Branch Houses, Distributors and Service Stations
Covering Every State in the Union

AVERY

Motor Farming, Threshing
and Road Building Machinery

Avery "Grain Saver"
"Yellow-Fellow" Thresher

ing for it, it is too often spent on luxuries without any attempt to save any of it or think of necessities. While no one would advocate the doing away with gifts of money to children, no thoughtful person would advocate irregular gifts and indefinite payments as permanent treatment for financial training.

Judgment must be used in not forcing adult standards upon children. The child should gain pleasure from the spending of money. As the desires of the child are so different from the adults the latter is often mistaken as to what will give the pleasure.

The mere getting and keeping money, although important are not the only aims of financial training. Wise spending and investing are equally important. The incurring of debt or borrowing from a future allowance should be discouraged. Children who form this habit will later become victims of the loan shark. People inexperienced in business often have their eyes opened to the fact that they have been defrauded out of their earnings by a man who offered them enticing investment. Children should be taught to regard with suspicion any investment that offers a big return. Any offer above a good current rate of interest is probably a dangerous risk for an untrained investor.

The amount of money at the child's disposal should be limited in order that he have the best financial training. In the case of the middle class families the problems of properly conducting the income and expenditures of the children is nearly always a difficult one. If the child's associates spend money extravagantly he is likely to want to do so. Often each child tells his parents how the other boys and girls spend money and thus it is difficult for a single parent to resist the appeal for money. The difficulty often becomes great at the high school age. Both girls and boys often feel humiliated when they can not spend money as freely as associates. It is often difficult to convince them that they are not unjustly treated. Two Purdue University senior girls in their practice teaching in the West LaFayette public schools have worked out a scheme for teaching first year high school girls about

how much they might reasonably expect to spend on clothes. In order to prevent any embarrassment on the part of the pupils with reference to the financial income, the niece of the teacher in charge was taken as the class problem. The girl was the age of the girls in the class and was also in the first year of high school. After the income and the amount which each member of the family might reasonably expect to receive had been discussed, the girl's allowance was discussed in detail. Much time was spent on her clothing budget. An inventory of the clothes on hand was given and a budget for the year's clothing was made out. In connection with this came the appropriateness of dress for different occasions. The girls without the least financial embarrassment or bigotry drew on their own wardrobes for illustrations for the plan. They drew their own conclusions that they had at times been unreasonable in their requests for new garments.

Some people prefer paying the child for performed tasks, others feel that this commercializes the home. Often parents prefer a free gift and free service. The child is given an allowance just as he is given food and clothing and in turn he is to perform certain duties in the household just as other members of the family perform. The success of any method depends upon the attitude of the parents and the children as well as upon the social surroundings. Some will find one method best, some will find another. But in no case should financial responsibility be overlooked.

Simple budget making and account keeping can be taught to very young children. One boy whom I have in mind was given an allowance of 25 cents per week. Upon investigation the mother learned he had spent one week's allowance in the following manner:

Candy05
Movie10
Pencil pad.....	.05
Ice cream05
—	—
Total25

She at once saw that: Nothing had been saved, all had been spent on self.

(Continued on page 432)

Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

ACME-EVANS COMPANY

Indiana's Largest Millers

INDIANAPOLIS, IND.

Soy Beans

THE Soy Bean, *Glycine Hispida*, is a native legume of South Eastern Asia, and is one of the most important agricultural products of Northern China and Japan. This plant is an upright summer annual growing from one to four feet high with hairy stem and leaves and has only occasionally a tendency to vine. The bean-like seeds of the soy bean carries from sixteen to twenty-one per cent oil and are used for human food and for feeding live stock. The oil is often pressed out and used for human food, and in arts, while the resulting meal

be hogged off or used in the silo. The seed bed is prepared as for corn and the seed are planted one and a half to two inches deep. If they are to be harvested for grain use about thirty pounds per acre, plant in rows and cultivate as for corn except when the leaves are wet. If planting for hay or forage the seed may be drilled or broadcast at the rate of one to one and a half bushels per acre. If for pasture planting in rows will lessen the loss by tramping, and the hogs should not be turned in until the pods are nearly ripe. When cut for hay they should be



An excellent catch crop to take the place of clover that has failed.

is fed to animals or used as a fertilizer and is about equal to cottonseed meal as a feed. Soy beans yield a larger amount of seed than any other legume suited to the temperate climate. Their main use in this country at the present time is for forage. They will grow on any good corn land and require practically the same climate as corn. Due to their draught resistance they are well suited to light sandy soil. They will grow on slightly acid soil.

The beans are planted in the spring after the ground is thoroughly warm, usually after corn planting; although they may be planted in the row with the corn at the time of planting if a special attachment is used on the planter. This is especially desirable if the corn is to

cut when the entire plant is green and the pods are well formed. If not cut until the leaves begin to turn yellow the stems become woody and the leaves easily drop off. The hay is equal to alfalfa hay in feeding value and yields from one to three tons per acre. Soy beans for the silo should be mixed with corn at the rate of one ton soy beans to three or four tons of corn. Soy beans alone make a rank smelling silage. The corn and beans may be grown together or mixed as ensiled. The chief value for soy beans in the north is for sandy soil or as a catch crop when clover or other crops fail. They are ready to harvest for grain when the leaves drop off and may be cut with a mower or with a side delivery attachment or binder. The beans

Oliver

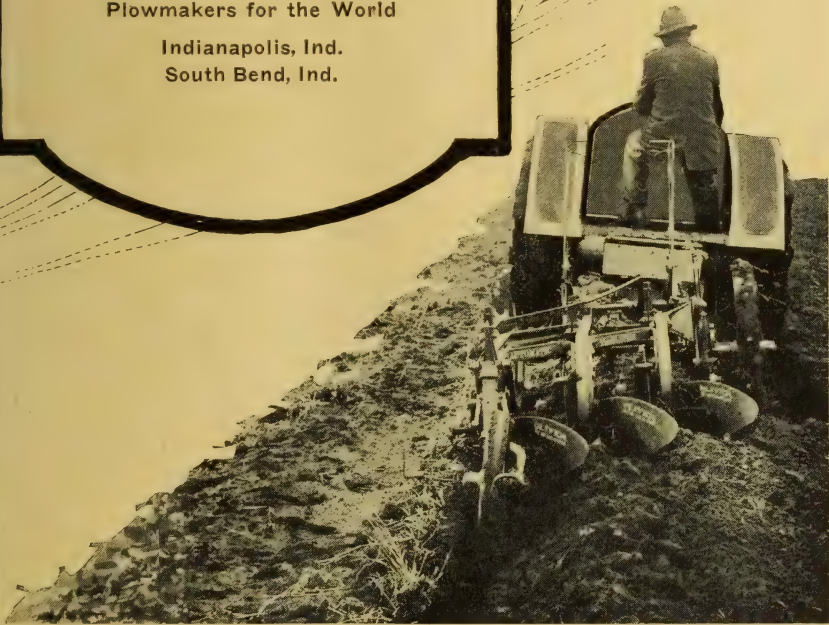
The Quality of Plowing

obtained in a minimum time with a minimum amount of labor by the use of Oliver tractor plows prevents spending unnecessary effort to accomplish desired plowing results.

Oliver Chilled Plow Works

Plowmakers for the World

Indianapolis, Ind.
South Bend, Ind.



shatter easily when dry and should be cut when slightly damp to prevent loss. They may be thrashed with a thrasher with the lower concave substituted with a blank and with the cylinder run at low speed.

The seeds of the soy bean are among the richest in protein of all seeds used for feed, and are also rich in oil. They

for fattening cattle, being only slightly inferior to cottonseed. Owing to the high protein content soy beans should always be fed in combination with some carbonaceous concentrates as corn. Soy beans may be sown with corn for hogging off, thus furnishing a protein rich feed to supplement the corn and saving the expense of harvesting.



Excellent forage for hogs on a corn rotation.

contain as much digestible crude protein and considerably more digestible crude fat than linseed meal. Because of their high protein and mineral content they are good for growing animals and for balancing rations. The great demand in this country for seed has prevented their extensive use for stock feed. They should be fed sparingly to dairy cows as they cause soft butter but may be used

If soy beans are to be grown on land which has not previously been used for soy beans they must be inoculated with nitrifying bacteria. This may be done by using soil from fields previously used for soy beans or by the use of pure cultures.

Itto San, Early Brown and Holly Brook are good varieties for Indiana. Holly Brook is a good variety to plant in corn.

T'day and Yest'rday on Th' Farm

By F. C. Palin.

WHEN you look at the farmer of t'day you can't help marvelin' at th' wonderful progress we've made in th' last twenty years. I heard a farmer say the other evening, as he'd got his money back on a pair o' hole proof sox that he'd worn only six months. Th' the farmer that used t' ride or drive t' town once a week t' get a stale country newspaper now knows how many "reds" they have captured in th' world th' next mornin'. He knows what Senator La Foullette opposed yisterday an'

he knows where Bryan talks t'night. It used t' be impossible t' look after a forty-acre farm, a wife an' nine childurn an' keep track of as many things as th' farmers Fedorashun is goin' t' do. Twenty years ago a farmer'd go t' th' woods an' cut wood weeks at a time with out worryin' over any o' th' pop'lar things o' th' day but now he can't do his feedin' 'till he sees who an' how many have been killed in 'ottomobile 'recklessness or by Mexican bandits, then like th' government he goes peacefully on with his work.



200 lbs.

CORN GLUTEN FEED

200 lbs.

BRAN

25 lbs.

**OIL MEAL OR
COTTON SEED MEAL**

Feed This Ration to Get a Large Milk Flow at Low Cost

The Buffalo Corn Gluten Feed grain mixture pictured above is fed to thousands of cows in the nine states that supply the people of New York City their milk.

If you have never fed highly digestible Buffalo Corn Gluten Feed, tell your dealer you want some and try this mixture:

200 lbs. Buffalo Gluten Feed

200 lbs. Wheat Mill Feed, or Bran

25 lbs. Linseed or Cottonseed Meal

This grain mixture will make big milk checks for you, whether the market where you sell your milk and cream is New York or Chicago, Detroit or Cleveland.

Corn Products Refining Company
New York Chicago

Write to 213 E. Illinois Street, Chicago, Ill.

"Nowadays a farmer can plow along leisurely 'till about ten o'clock, have his wife jump on th' tractor, hop in a tour-in' car an' go t' town an' get a bottle o' near beer an' be back in th' hurry without stoppin' th' works or even be missed. T'day he kin milk a dozen cows by electricity, jump int' a form fittin' suit o' clo'se an' motor t' town an' play a little pool or see Evelin Thaw in th' movies an' git up in th' mornin' an' discuss th' Shantung question, or as t' how th' peace treaty should be, with all th' intelligence of a statesman.

"A few years ago if a farmers wife's mother wuz goin' t' pay 'em a visit she wuz five days behind her postul card. T'day she jumps off th' interurban an' surprises 'em before they've had time t' git out a white table-cloth.

"A few years ago a farmer know'd what he could git fer a calf or his eggs or his hogs before they'd leave th' farm, now he don't know what he's t' have fir 'em 'till he gits 'em t' town.

"If he wants a new suit o' clo'se he straps a calf on th' runnin' board, an' if his wife wants a new tailor'd dress she hunts up a few eggs, an' in fifteen or twenty minnits ther park'd in front a' th' court house.

"Ther hain't anything a modurn farmer can't have that th' city folks have got but sunless days an' city warter. A farmer's wife kin run out to th' mail box an' git a apurn full o' mail in th' mornin' an' read all th' fore-noon an' go t' town after dinnir in th' Ford with a dozen eggs for a pound of seventy-five cent creamry butter, or a little cream for a twenty dollar hat, without feelin' that she had been negligent or extravagant. City folks can't tell a farmer's wife from any other wife. She can buy a sealskin coat without th' saleslady ever dreamin' that she'd just weaned a calf or made a bar'l o' soap. Th' farmer an' his wife used t' cum t' town all cover'd with dust an' bed quilts in a big green wagon, an' drive around behind th' court house an' jump out stiffer'n a polker. Mother an' th' childurn would take a roll o' butter an' some eggs t' th' grocery an' git th' groceries an' a lamp chlmney, while paw would git his plow sharpen'd

an' a ax handle put in. Then they'd all meet an' maw an' th' childurn would go t' th' dry goods store an' stand' till paw called at th' pustoffice an' waited till th' pust-master dug his weekly paper an' Kansas land circulars out o' th' general delivery. Then they'd all pile in th' wagon an' pull fer hum, an' by hurryin' an' havin' a early dinner all this could be did on a Satturday afternoon. But th' telephone, good pikes, interurban cars, improved machinery, 'ottomobiles, an' th' regulatin' o' th' prices, have changed all o' this.

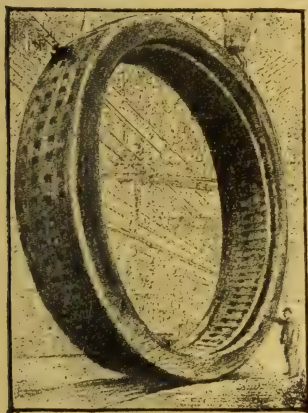
"T'day th' farmer is so sophisticated an' free o' whiskers that you'd never suspect he wuz a farmer if you didn't see th' collector after him, an' th' cause o' his discontentment, in most cases, is his liver. Twenty years ago a farmer could go t' his corn crib, put ten ears o' corn in a bag, go t' a corn show an' with a plug o' long-green tobacer win a mowin' machine, t'day a record o' every ear must be kept from th' time it leaves its parent t' th' show room, ever whisker pul'd off, every sign o' infidelity eliminated, each ear so much alike that they are known t' be of th' same family before they can win a look frum th' judge. Twenty years ago a farmer could husk coin all day t' fill a common wagon bed an' set around th' pustoffice all evenin' an' tell o' his big yield; t'day it has t' be counted, weigh'd, measur'd an' swor'd to by a expert before you can have forty bushels t' th' acre. Twenty years ago any farmer that could work a balky hoss or milk a kicky cow wuz regarded as a expert agriculturalist; t'day he hes t' be a member of th' Indian Corn Growers' Association fer three or four years t' be able t' tell sor'gum frum brumcorn."

The First National and Veedersburg State banks of Fountain county, recently distributed 21 head of fine pure-bred Jersey cows among 15 farmers of that community.

At least six demonstrations of better agricultural methods will be conducted in Union township, Clark county, the coming year under the direction of County Agent V. J. Mann, co-operating with the local farmers.



Mississippi River Power
Company, Keokuk, Iowa



A casting for one of the huge water-wheel driven generators installed in the Mississippi River Power Company's plant at Keokuk. This installation will ultimately consist of thirty of these machines, giving a total capacity of 216,000 kilowatts (300,000 horse-power). It is the largest hydro-electric development in the world. The General Electric Company builds generators for water-wheel drive in sizes ranging from 37½ to 32,500 kilowatts and the aggregate capacity of G-E units now in successful operation is in excess of four million horse-power.

Utilizing Nature's Power

ELECTRICAL energy generated by water power has grown to be one of our greatest natural resources—and we have only begun to reach its possibilities. It mines and refines our ores, turns the wheels of industry, drives our street cars and lights our cities and towns. The power obtained from Nature saves many million tons of coal every year.

At first the field of its utilization was limited by the distance electricity could be transported. But soon research and engineering skill pointed the way to larger and better electrical apparatus necessary for high-voltage transmission. Then ingenious devices were invented to insure protection against lightning, short-circuits, etc., which cause damage and interrupt the service. And now all over the country a network of wires begins to appear, carrying the magic power.

The General Electric Company, with its many years' experience, has played a great part in hydro-electric development. By successfully co-ordinating the inventive genius of the company and its engineering and manufacturing abilities, it has accomplished some of the greatest achievements in the production and application of electrical energy.

The old mill wheel of yesterday has gone. Today the forces of immense volumes of water are harnessed and sent miles away to supply the needs of industry and business and the comforts of the home.

General Electric Company
General Office
Schenectady, N.Y. Sales Offices in
all large cities.

Raising Apples on Cheap Land

By R. G. Milner, '20.

EVERYONE who is acquainted with the present land situation is at once impressed with the abnormally high prices of productive land and is led to wonder what disposition is to be made of the vast and ever increasing areas of non-productive soils which are not returning a decent rate of interest on the investment. This latter condition is caused either by the naturally deficient supply of mineral nutrients in such soils or the robbing of these soils through unwise and exploitive methods of farm management.

Although Indiana has a small per cent of such unproductive land compared to some of the Eastern and Western states, there is still enough poor land in our state to warrant a careful consideration of the ways and means by which these semi-productive areas may be converted into useful and profitable investments. Agricultural publications have been in the past and are still filled with numerous remedies and panaceas for relieving this deplorable situation. They have varied in variety from that of allowing the land to rest for a number of years and thereby regaining its lost fertility through the slow and expensive process of nature, to that of applying high priced fertilizers, and the attempt at growing legumes to turn under and increase the organic matter, and ultimately the humus content of the soil. Either one of these methods is extremely expensive as regards time, labor and money. In either case the contour and nature of the land will be the deciding factors as to the practicability of such methods. But in any case the owner of an unprofitable and unproductive piece of land, should not expect immediate and highly satisfactory results from whatever type of farming that he decides upon. All will agree that the logical method of procedure is one that will insure a building up of the land and at the same time, if possible, provide some income. Luckily there is one type of agricultural enterprise that meets the conditions of soil, limited in its productive powers, and lim-

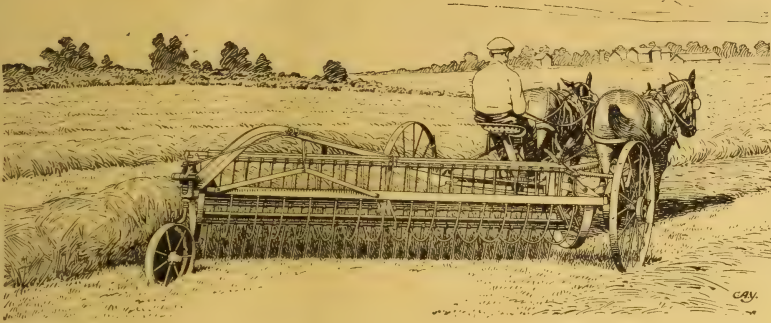
ited capital on the part of the farmer. This type is orcharding.

The growing of fruit, especially apples, has much to recommend it. Numerous examples of profitable orchards located in communities where other agricultural crops are of only minor importance, lends weight to the above statement. The northern New York apple belt is one of the largest and most remunerative in the United States and occupies an area of land that does not prove profitable when planted to other crops. The mountains of Virginia, West Virginia and the Carolinas are yearly increasing their orchard areas because orcharding has become one of their leading industries. In each of the above districts much of the land planted to fruit was originally worn out tobacco and cotton ground. In our own state the apple country is in the southern part of the state and occupies sections which would never return a reasonable rate of interest if planted to field crops.

The main objection voiced by the farmer when the subject of setting out an orchard is broached to him is the length of time necessary for an orchard to come into bearing. From the standpoint of the farmer who is making 6 per cent or more on his land investment by raising field crops the objection certainly has some weight. But on the other hand, the owner of a non-productive piece of land has nothing to lose, and everything to gain by setting out an orchard, even though the time element does enter in.

The demand for fruit and fruit products is steadily increasing and to judge by the number of neglected farm orchards over the country, there seems to be justification for planting large areas, especially in Indiana, to meet the local demands.

Aside from the profits to be obtained from vegetables there is the relatively small investment necessary to engage in fruit growing. Practically the only items of expense in establishing an orchard are: The cost of preparing the land for planting, cost of nursery stock, and the planting of the trees. A fair



The Correct Way to Air-Cure Hay

It isn't sun-drying that puts quality into hay, but **air-curing**. And hay is air-cured best when side-raked and tedded into light, breeze-sifting windrows such as those that trail off in the way of the **International Combined Side-Delivery Rake and Tedder**.

With this machine it is possible to follow closely behind the mower, as it has left-hand delivery, and rake and ted the hay before the leaves begin to wilt. The teeth of the rake strike the heads of the hay first and rake clean because of the fact that they work against the leave crotches so that the stems cannot slip past the rake teeth. The hay is turned completely over and deposited in snug, airy windrows, through which the air circulates freely, curing evenly both stems and leaves with its magic touch.

Side-raking and tedding is good haying practice, and everywhere progressive farmers are recognizing this fact. Properly air-cured hay is **quality** hay—and there is no better implement for air-curing than the **International Combined Side-Delivery Rake and Tedder**, sold by International dealers everywhere.

INTERNATIONAL HARVESTER COMPANY

CHICAGO

OF AMERICA INC.

U S A

estimate of the costs connected with the setting out of an orchard together with the expense incident to fertilizing around the trees and the costs of the seed and sowing of a cover crop should not exceed \$30 an acre for the first year.

For the second and succeeding years the cost will be appreciably lower until the trees attain a size which necessitates more work in pruning and spraying, at which time the cost per acre will approach the initial cost per acre. The returns desired from the young growing orchard will in large measure depend on the treatment of the soil. In case the prospective orchardist uses liberal methods of increasing the organic matter content of his soil by plowing under several green manure crops such as rye, buckwheat or millet, he may after three or four years, depend on an inter crop of potatoes or soybeans as a source of revenue.

But it must be kept in mind that the growth of the trees to maturity and bearing is the purpose in view, and should intercropping tend to rob the young trees of the necessary quantities of plant nutrients, such practice should be discouraged, as helping to defeat the ultimate end in sight. In case the land is too poor to practice cultivation, or to obtain a satisfactory stand of a cover crop each year, probably the most profitable method of management would be to allow the orchard to set itself in grass. The space within six feet of the trees should be mulched with straw for the best results. The grass may be cut and allowed to fall back on the land or else allowed to fall over itself and form a mulch to protect from severe freezing and erosion. The sod system of orchard management tends to regulate the growth of the trees and forces them to harden their wood early in the fall. However, unless the trees are fertilized with barnyard manure or other fertilizers, the sod may encroach on the supply of plant-food needed by the tree.

Naturally bringing an apple orchard to maturity and bearing requires patience and constant care; but when one considers the poor land which may be utilized, the small investment needed for financing the venture, and the

ultimate returns to be obtained, the time element should not be allowed to exert an undue influence in the farmer's decision to plant an orchard. As in any business, the attitude of the one interested will determine the degree of success attained.

The farmer who plants his trees and then sits complacently by until the trees become of bearing age, may expect returns exactly in proportion to the interest and care he has himself given. On the other hand the prospective orchardist who sees in his mind's eye not merely the whips of trees and the yellow clay of his orchard site, but who has introspection enough to visualize his dream of a profitable block of trees, and who puts forth every effort towards a material realization of his project, will do much to decrease the area of unproductive land and also better his own condition.

BOYS' AND GIRLS' CLUB ROUNDUP.

This year the annual boys' and girls' club roundup will occur from May 3 to May 7 at Purdue.

It is expected that at least one thousand young people will be in regular attendance with a record attendance of two to three thousand on special occasions.

The boys and girls will take an active part in judging and demonstration contests. County teams have been practicing throughout the winter for the contests in live stock and corn judging, consequently some very keen competition is expected between the various teams.

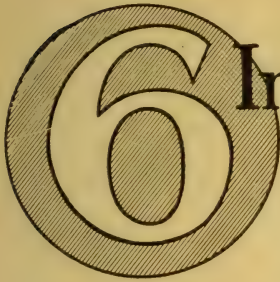
The "roundup" this year promises to be bigger and better than ever before. Lecture work will be largely supplemented for the practical.

Geo. E. Farrell, national leader of boys' and girls' club work, as well as other influential club leaders and noted speakers, will be here during the period.

Extensive plans are being made to have a larger attendance at Gala Week this year than ever before. H. G. Reissner has been named as chairman of the entertainment committee. It is expected that a large number of students will remain over for the Gala Week exercises.

The Moline

Tractor is Universal



6 Indispensable Results

The principle of doing all field operations with one man sitting where he can watch his work is correct, or farming has always been done backward, and the operator would always have ridden or led his horses instead of driving them.

The Moline Universal Tractor places the power of nine big horses where the horses stood — is driven just like horses are driven, from the seat of the implement, and hitched up to the implements just as horses are hitched.

No duplication by horses *Because*

A large saving in labor *Because*

Great ease of operation *Because*

Can back and turn short *Because*

Better and faster work *Because*

Power used as horses are used *Because*

Does all field work, including cultivating, harvesting and belt work

One man completely operates both tractor and all implements

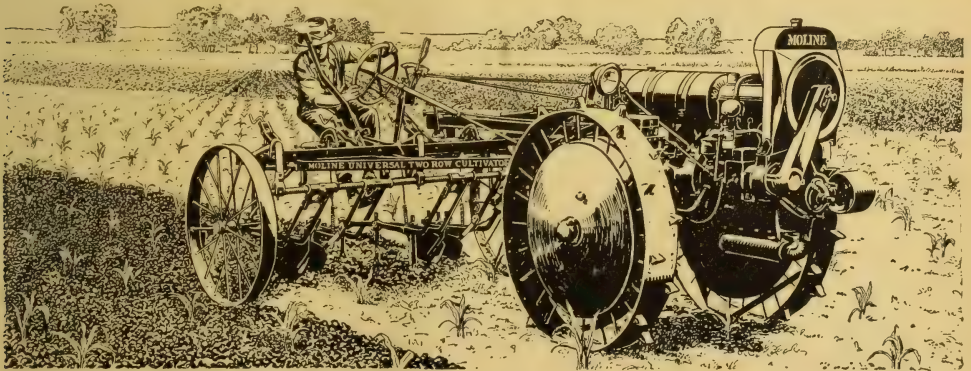
A single seat in the center of all controls of tractor and implement

Single unit of operation — tractor and implements form but one unit

Operator sees all his work — "Foresight is better than hind sight"

Tractor power in front of the work with operator behind the work

Utility Is Not Sacrificed for Price



If desired you can use the "drag behind" or horse drawn implements you now have with the Moline Universal Tractor, the same as with other types of tractors.

See your Moline Dealer or write our nearest branch for full information.

Moline Plow Company, Moline, Ill.

Branches at:

Atlanta
New Orleans
Dallas
Oklahoma City

St. Louis
Poughkeepsie, N. Y.
Baltimore
Los Angeles

Stockton, Cal.
Spokane
Portland
Salt Lake City

Denver
Kansas City
Omaha
Minneapolis

Minot, N. D.
Sioux Falls, S. D.
Des Moines
Bloomington, Ill.

Indianapolis
Columbus, O.
Jackson, Mich.

The Pink and Green Aphid of Potato

By H. E. Engle, '20.

ALTHOUGH this pest has not been of vital importance in Indiana it has caused slight damage in this state and has caused great destruction in our sister states, the most important being the outbreak in Ohio in 1917. At that time it was relatively new and for want of a better name it was popularly known as the "Kaiser Bug." It is important that growers of potatoes and tomatoes in Indiana be familiar with this insect both as a protection against possible future outbreak and because the treatment or remedy for all aphids or "plant lice" is essentially the same, and practically all the agricultural crops are subject to loss from plant lice.

History of Pest in North America.

The insect was first described in 1882 by Ashmead on material from wild pepper vine in Florida. At first it was not thought to be of economic importance but was found destroying potatoes in Canada in 1905. It was discovered in Maine in 1906 and continued in Maine for three successive years. The next year it was widespread over the United States causing serious loss in Massachusetts, New Jersey, Maryland, New York, Pennsylvania, Virginia and Kentucky and later, parts of Indiana and Michigan. It did the most serious injury in the Cincinnati district in southwestern Ohio. Appeal was made through the local county agent to the State Experiment Station and steps were taken to stop the spread but it covered a greater part of the state and completely destroyed the crops in some places and the ground was plowed for other crops.

Appearance of the Insect.

The full grown insects as seen during the summer may be any of four distinct forms:

1. Green winged adult.
2. Green wingless adult.
3. Pink winged adult.
4. Pink wingless adult.

These are all females producing live young without the aid of males for sev-

eral generations. The wingless forms greatly outnumber the winged forms. In general the pink and green aphids greatly resemble the other plant lice. They are slightly larger than average-sized aphids and have a solid color, either pink or green. They attack leaves, stems and blossoms and appear to prefer shade as they invariably stay on the under side of the leaf, changing if the leaf is turned over.

Life History.

This insect lives over the winter as a shiny black egg. In the spring these develop into producing females, the winged forms migrating to potatoes. Only about ten days is required for the daughters to become full grown and begin producing young and thus many generations are possible during the summer season, especially when they appear in early June. The last generation produces a generation of both sexes and the over-wintering eggs are produced. At first they have a greenish color, but later become jet black.

Rate of Reproduction.

In order to secure definite data concerning the rate of reproduction the following observations were made. On July 3 a female plant louse was placed upon an insect-free tomato plant that was protected by cheese cloth. On July 5th she was surrounded by six young.

July 6—Female surrounded by eight young.

July 10—Female surrounded by nineteen young.

July 12—Female surrounded by thirty-eight young.

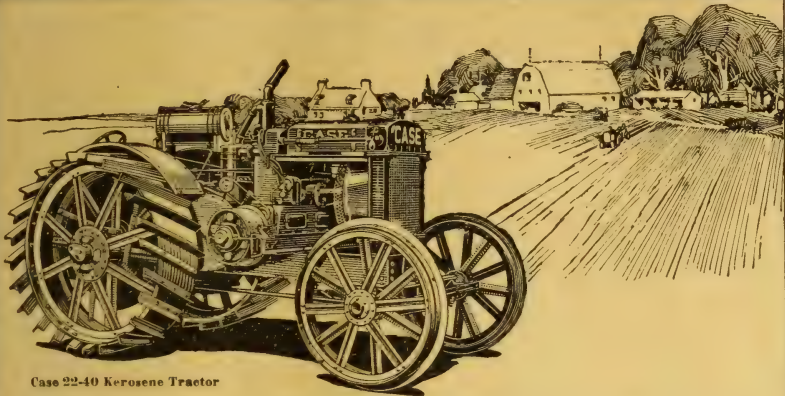
July 14—Female surrounded by fifty-four young.

July 16—Female surrounded by sixty-one young.

July 17—Female surrounded by seventy-three young.

With five females producing young at this rate with the progeny of one insect numbering 73 at end of two weeks, it

(Continued on page 434)



Case 22-40 Kerosene Tractor

We could build Case Tractors cheaper —but they would cost you more!

Built into every Case Kerosene Tractor is a high degree of immunity from frequent repairs, replacements and undue wear. It would cost less to use iron castings in many places instead of the drop-forged steel we do use; but it would cost *you* far more for replacement of broken and worn out parts.

We could save a lot by using cast-iron open gears instead of cut steel gears running in oil-tight housings; but later on, you'd pay many times the difference for extra parts, and lose more by delay.

Thus, all through, in design, material, workmanship and equipment, we build Case Kerosene Tractors the best that they can be built instead of building cheaply and "passing the buck" to you.

Case Kerosene Tractors are built in a standardized design of three sizes: 10-18, 15-27 and 22-40 h.p. respectively and are uniform in dependability, durability and simplicity of operation and adjustment.

Back of Case Kerosene Tractors is the great line of power farming machinery built by the J. I. Case Threshing Machine Co., including equipment for keeping a Case Kerosene Tractor profitably employed throughout the year.

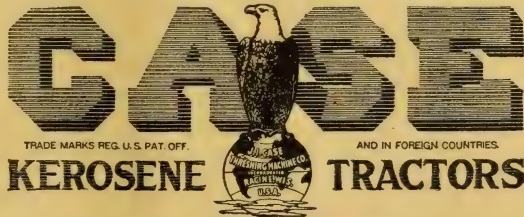
Write for free catalog descriptive of Case Tractors, and listing our great line of tractor drawn or driven machinery.

J. I. CASE THRESHING MACHINE CO., Inc.
Dept. CB-4, Racine, Wis., U. S. A.
Making Superior Farm Machinery Since 1842



Look for the
EAGLE
Our Trade Mark

To avoid confusion, the J. I. CASE THRESHING MACHINE COMPANY desires to have it known that it is not now and never has been interested in, or in any way connected or affiliated with the J. I. Case Plow Works, or the Wal-lis Tractor Company, or the J. I. Case Plow Works Co.



Many Prizes Offered to Exhibitors at Egg Show

Several Miscellaneous Prizes Included in List. Exhibits to Be Divided Into Six Classes

The cups to be offered at the Twelfth annual Purdue egg show, May 3, 4, 5 and 6, have been secured. The collection consists of twenty silver cups that will be offered as premiums at the show. In addition to the cups which are valued at \$70, there will be \$40 worth of ribbons as well as \$50 in cash prizes.

There will be several miscellaneous prizes offered, which consist of yearly subscriptions to important agricultural papers and journals; an incubator; 18 settings of eggs and a variety of neckties and silk hosiery.

The exhibit will be divided into classes according to the exhibitors.

Class 1. Fanciers' class—Open to anyone not a student in Purdue University, fanciers and farmers especially.

Class 2. Experimental Station and University class—Open to any Experimental

Station or University and College, excepting Purdue, in the United States and Canada.

Class 3. Students' class—Open to Purdue students only.

Class 4. Boys' and Girls' class:

A.—High Schools—Open to all students attending an Indiana High school.

B.—Grade Schools—Open to all students attending an Indiana grade school.

Class 5. Commercial-Egg class—Open to anyone not a student in Purdue University. Farmers, commercial egg producers and packers are especially invited to enter this class.

The judges of the show will be announced later. The catalogue has been delayed but will be ready for distribution in the near future.

Churns

By Ralph E. Roberts, '21.

THE present demand for butter of high quality in large quantities necessitates proper creamery equipment. Included in the list of creamery equipment is the churn. It is this piece of equipment that performs the principal mechanical operations in the manufacturing process of butter.

Among the many processes through which the cream must go before the product called butter is turned out are the two important ones termed churning and butter working. Churning is the term applied to the process by which the fat-globules of milk or cream are made to unite into visible aggregations, and to separate from the milk-serum or buttermilk. This massing together of fat-globules is usually produced by the vigorous agitation of cream in vessels especially constructed for the purpose, called churns. The object of working butter is to uniformly distribute the salt and to give the butter a plastic consistency and a compact form necessary for

convenient handling. In the past the churn included only the churning process, while now it performs also the working process. Thus by tracing the development by which the two processes were combined, we at the same time trace the development of the modern churn.

In order to appreciate the modern churn it is necessary to become familiar with churns in general and to know some of the most important steps in the development of churns which lead to the combined churn and butter worker. Butter may be produced by mere stirring of cream. Agitating cream by passing bubbles of air through it will also cause it to churn. Many churns have been devised, each of which gives a different kind of motion to the cream in churning. Thus, we have (a) churns with a beating action, (b) swinging, cradle, and rocking churns, (c) horizontal churns with dash, (d) vertical churns with dash, and (e)

(Continued on page 442)



Wheels on a track
—the Cletrac way
—take less power

Does Cletrac Ability Measure Up?

THE Cletrac meets the Spring rush when time is limited, weather unsettled and help scarce and costly.

It replaces four to eight horses, works longer hours and more days, saves time and cuts costs.

A Cletrac speeds up plowing and fast plowing pulverizes the soil and cuts down work on the seed bed. It travels easily over soft and sticky ground, turns short, gets the corners and swings back to the furrow quickly. Puts more acres under cultivation and helps produce bigger crops.

Besides plowing it prepares the seed bed, harvests the crop and does hauling. In winter when horses are idle, eating expensive food and getting daily care, the Cletrac is busy clearing roads and sawing wood. When not working its keep costs nothing.

The quick popularity of the Cletrac has led to a bigger output with lower manufacturing costs. That's why we can offer an *improved* Cletrac—and at the same time lower the price from \$1585. to \$1395., f. o. b. Cleveland.

You are going to want a tractor some day. Get all the information on tractors now, while you have time to study the various makes carefully. "Selecting Your Tractor" is an interesting booklet that tells you all about the Cletrac—write for it today.

The Cleveland Tractor Co.

Largest Producers of Tank-Type Tractors in the World

19123 Euclid Avenue

Cleveland, Ohio

Alumni and Local

INDIANA HOME SPECIAL.

The Indiana Home Special is now being operated over the New York Central lines in this state. The train consists of four passenger coaches equipped with modern water, lighting and power systems. It carries feature exhibits showing practical equipment for the kitchen, laundry, bath room and dairy room, as well

ATHLETICS.

How is this for an all-state team?
Tilson (c)Forward.....Purdue
ChurchForward.....Purdue
CampbellCenter.....Purdue
WhiteGuard.....Purdue
MillerGuard.....Purdue
Lambert's five aces have certainly showed up fine this year. The Purdue



The first day of the excursion tour. Note the interest of our future citizens.

as suggestions on home furnishings. The train is accompanied by a special corps of lecturers and demonstrators who explain the modern appliances and help the farmer and his wife work out their particular problems.

The tour is being made under the auspices of Purdue University in co-operation with the State Home Economics Association, the Indiana Federation of Farmers' Associations, and the New York Central lines. The object of the tour is to stimulate a greater use of modern equipment in farm homes. It is a tour in the interest of Indiana people and the slogan is "Better Homes for Indiana." So far the trip has met with unusual success and the Agriculturist wishes to take this opportunity of commending the organizations connected with it, upon their most laudable undertaking.

The man who sidesteps his obligations is apt to find his path a muddy one.

men are all mighty proud of them. Purdue stands in second place in the conference this year, losing first place by four points. In the early part of the season Illinois and Ohio State defeated the Purdue five, each leading them two points at the close of the game. Later, however, Purdue defeated each of these teams and scored more points in the second game with Ohio State than Ohio State did in both games, and almost doubled the score on Illinois. White has been elected captain to lead next year's tossers.

The following makes a good summary. Note the finish with eleven straight games:

Purdue.....42;	A. G. U.19
Purdue.....40;	Notre Dame22
Purdue.....27;	Em Roes24
Purdue.....51;	New Castle16
Purdue.....19;	Kokomo14
Purdue.....22;	Fort Wayne27
Purdue.....34;	Wabash38
Purdue.....31;	Illinois33



TOP DRESSING TALKS, No. 6

Ammonia Pays in the Orchard

Ammonia is the most important fertilizer element used in fruit production.

It is ammonia that promotes the vigorous wood growth so necessary for the formation of fruit spurs and fruit buds.

Quickly available ammonia added before blossom time will invigorate the fruit buds and increase the amount of fruit set.

The failure of the fruit to set and the early falling of fruit is generally due to ammonia starvation.

In some sections an early application of quickly available and non-leaching ammonia has increased the yields four and five times that of unfertilized trees.

ARCADIAN

Sulphate of Ammonia

Arcadian Sulphate of Ammonia is the best nitrogenous fertilizer for fruit production. It contains one-third more ammonia than any other top-dressing and this ammonia is all soluble, quickly available and non-leaching.

It can be applied early and it will last throughout the season. Its fine, dry crystals make it easy to apply by hand or machine.

Give your orchard and your small fruits a top-dressing of Arcadian Sulphate of Ammonia and note results. Apply 100 to 150 pounds per acre over the area of feeding roots just before blossom time. You will use it again. Place your order now.

Write for free bulletins "Fertilizing the Apple Orchard," No. 85-c, and "Sulphate of Ammonia for Vegetables," No. 89-c.

Baltimore, Md.
Atlanta, Ga.

The *Barrett* Company

Medina, Ohio.
Berkeley, Cal.

AGRICULTURAL DEPARTMENT, NEW YORK

Purdue.....35;	O. S. U.37
Purdue.....17;	Indiana 9
Purdue.....32;	DePauw31
Purdue.....35;	Wabash19
Purdue.....26;	DePauw25
Purdue.....51;	Northwestern16
Purdue.....36;	Illinois20
Purdue.....26;	Iowa21
Purdue.....42;	Iowa26
Purdue.....50;	Northwestern20
Purdue.....31;	Indiana20
Purdue.....63;	O. S. U.25

Coach "Eddie" O'Conner is giving the track squad its daily workouts and the men are showing up fine. P. E. Reed was elected captain to lead the Purdue runners.

It was not Hamilton's fault that Illinois defeated Purdue in the swimming meet in the early part of March, for he captured two firsts and two seconds and was easily the star of the meet.



A daily scene in the lecture coach of the Indiana Home Special.

BASEBALL SCHEDULE.

April 24—Wisconsin at Purdue.
 April 27—Illinois at Illinois.
 April 30—Iowa at Purdue.
 May 7—Michigan at Michigan.
 May 8—Ohio State at Ohio State.
 May 14—Ohio State at Purdue.
 May 21—Wisconsin at Wisconsin.
 May 22—Chicago at Chicago.
 June 2—Illinois at Purdue.
 June 5—Indiana at Indiana.
 June 8 or 9—Chicago at Purdue.

Farmers cannot cope with city people in the struggle for a square deal with an inadequate and antiquated country school system. Education is one of the principal factors in this struggle.

Coach "Humpty" Pierce is rapidly rounding his baseball nine into shape. There are four "P" men out for the infield positions, and one "P" man out for the outfield. Eight men are competing for the twirling staff. Captain McConnell, Barnaby, Ellis, Stuart, Ferguson, Strubbe and Diederich are probably the most promising infield candidates. Baseball schedule:

A rare combination: K. W. Huffine is a star football player, piano artist of first class and a member of the honorary Tau Beta Pi fraternity.

Men like to act freely and to have the credit of their actions.

See America First

A Mr. and Mrs. Vernon Hinkle touring
party taken at Pensacola, Florida,
Feb. 26, 1920.



The Call of the Tourist

Come join us.

We will personally chaperon a party leaving Indianapolis April 11, in our Standard Pullman for a 10-day tour, visiting at:

Pensacola, Fla., and New Orleans—in the land of History, Mystery and Romance.

Galveston, Texas.—The Island City with its Great Sea Wall.

San Antonio, Tex.—The Alamo City.

Laredo, Texas, on the Mexican Border, and

Hot Springs, Ark., in the heart of the Ozark Mountains.

Tour of the East will leave Indianapolis, May 2nd, visiting at Richmond, Va., Old Point Comfort, Forts Sumter and Moultrie, Washington, D. C., Baltimore, New York, Boston and Niagara Falls.

We have a week-end solid pullman Excursion to the Mammoth Cave in Kentucky, May 15th. A tour of the Pacific Coast June 15th, via the Canadian Rockies and returning via the Yellowstone National Park, and a tour of the battlefields of France in August.

Rates and Full Information Upon Request

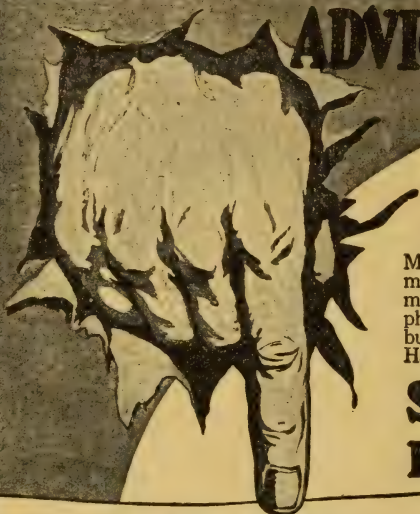
Mr. and Mrs. Vernon Hinkle

TOURS DE LUXE

336-337 Lemcke Building.

Indianapolis, Indiana

READ AND PROFIT BY THIS ADVICE Mr. DAIRYMAN



Mr. J. M. Hackney, owner and developer of several World's Champion cows, three of which are shown on this page, has proven the importance of feeding a ration which will furnish cows adequate maintenance, without which no cow can produce maximum flow.

Mr. Hackney has found out by experience that too much protein is injurious—that to secure maximum milk production cows must be kept at top-notch physical condition—the ration must be a health builder, strength and vitality giver. That's why Mr. Hackney likes his cows to have

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

ARDEN FARMS

J. M. Hackney, Owner

St. Paul, Minnesota

January Third, 1920

The Quaker Oats Co.

Gentlemen—I must say to you frankly that in my letter to you concerning feeding of Holstein Friesian Cows on my Arden Farms, I overlooked the most important factor, which I wished to bring out. I do not believe in a high protein ration. After the experience I have had, it is my judgment that breeders do not place enough importance upon the maintenance part of the ration of a cow. To secure a maximum yearly production means that a cow must be kept in good physical condition, nothing must be done to tear down the structure. It is my judgment that too much protein is injurious. There is good chance for argument as to just how much protein a cow should have, but I do not wish to engage in a discussion of the fine points, but I believe that a small amount of protein is better than too much, if one expects to have cows go on year after year and maintain their good health and produce their maximum of butter and milk. We mix most of our feed ourselves with the exception of SCHUMACHER FEED and BIG "Q" DAIRY RATION, with which we have been very successful.

Yours very sincerely,

(Signed) J. M. HACKNEY.

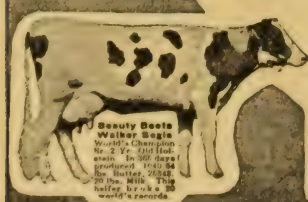
Owners of cows holding world's records, as well as owners of grade cows, alike endorse the merits of SCHUMACHER FEED, the great maintenance ration. 36 World's Champion Cows have been helped to make their world's records with SCHUMACHER as a part of their maintenance ration.

BIG "Q" DAIRY RATION is a *Quality* protein ration—when fed in conjunction with SCHUMACHER it supplies just the right amount of protein to stimulate milk production without "burning out" or tearing down the cows' physical condition.

The ideal SCHUMACHER BIG "Q" combination will keep your cows "going strong" month after month, and it's the cow that maintains maximum production over long milking periods that is the profit-producer. Feed dealers everywhere can supply you with these big result-producing feeds. Give them a trial. The best time to start is NOW.

The Quaker Oats Company

Address: Chicago, U. S. A.



Beauty Bessie
Walker Segie
World's Champion
No. 2, Yr. Old Hol.
weighed 1647.54
lbs. butter 27.00
20 lbs. milk. This
cattle for a 30
world's records.



Jewel Pontie
Segie
World's Champion No. 3
Year Old Holstein in 200
days produced 1211 lbs.
butter. 27.00 & lbs. milk.



Beauty Girl
Pontie Segie
of Arden Farms Inc.
World's Champion Jr.
1. Year Old Holstein
Friesian. At age of 8
mths. 2 months 7 days
produced 1112.93 lbs.
butter. 27.00 to lbs.
milk.

Write Me Quick If You Want One Of These Cars

*I will give away
June 30th*



A 1920 OVERLAND 4 *Completely Equipped.*
A 1920 FORD *With Starting and Lighting System.*
FREIGHT and WAR TAX PAID

YOU have a chance to own this splendid \$945.00 Overland touring car or this shiny new \$600.00 Ford, no matter who you are or where you live. Two people who answer my ad and act energetically in following instructions will get them. No one will be asked or permitted to spend a cent of his own money at any time.

THOUSANDS OF DOLLARS IN OTHER GRAND PRIZES AND CASH REWARDS

Besides these cars I will give away thousands of dollars in Cash Rewards, and Minor Grand Prizes. These will include Bicycles, Gold Watches, Diamond Rings, Phonographs, Silverware, Cameras, Money Rewards, etc., etc. (Prizes duplicated in case of a tie.)

Every one taking an active part in this contest will be well paid in cash, whether or not he wins a car or one of the other Grand Prizes. Just your name and address with five or more faces correctly marked in the picture below, starts everything. Act quick. Mail me the coupon today sure.

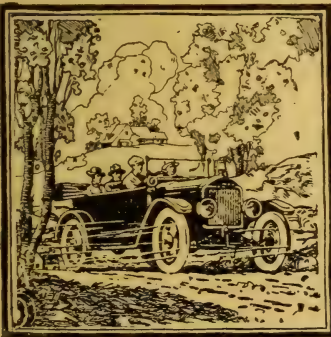
CUT OUT AND MAIL COUPON TODAY

CAN YOU FIND FIVE FACES? GET 1,000 VOTES.

In the picture are a number of hidden faces. See how many you can find. Some are looking right at you, some turned sidewise. You will find them upside down and every way. Mark each face you find with a pencil, write your name and address plainly on the lines below, clip out this coupon and mail to me now. If you find as many as five of the hidden faces I will enter you in this contest and credit you with 1,000 votes. Send me this coupon today SURE.

D. W. Beach, Contest Mgr., FARM LIFE, Dept. 334, Spencer, Ind.

Dear Sir:—Here is my solution of the picture. If correct, enter me in your Grand Prize subscription contest with a credit of 1,000 votes. I want one of these cars—send me full particulars



Name.....

Address.....

Bean and Pea Weevils

GROWERS, seedsmen and dealers in beans, peas, and cowpeas have long been subject to losses from bean and pea weevils. The U. S. D. A. in a publication on the subject states that bean and pea weevils have cost farmers and merchants millions of dollars annually. The outstanding fact concerning this loss, is that it is almost wholly preventable without a great deal of equipment or expense. A bean merchant may purchase a car of apparently perfect quality beans. A few weeks later he may find the lot infested with weevils, many beans having holes in them and having the inside honeycombed. Such occurrences as the above have caused much speculation as to how the "bugs" got into the beans, and these speculations have usually been far off the facts.

Indiana's losses have been largely confined to the dry cowpea crop, few beans and field peas being commercially grown in the state. However, gardeners have suffered much annoyance. Soy beans are not attacked by weevils.

The adult weevil is a small dark beetle shaped like a tumblebug, but only one-eighth to one-fifth inch in length. Some are solid in color, others have white spots. The life history of the insect is as follows: About the time the first pods form, the adult weevils, which have wintered in storage houses or other hiding places, fly to the fields and deposit their eggs on the pods. These eggs are nothing more than whitish specks one-fiftieth to one-twenty-fifth inch in diameter. They are unnoticed in most cases. Very small grubs soon emerge and immediately burrow through the pod into the seed. The seeds mature so much faster than the grubs grow that at maturity the hole through which they entered is invisible and infested seed seem perfect to the average grower. In storage the grubs eat around through the seed, never gnawing through the cuticle, however. At maturity they are one-fourth inch long or less and ceasing to feed, they lie dormant awhile and change to the adult beetle and emerge just as caterpillars spin cocoons

and change to butterflies. Bean and cow pea weevils lay eggs on the dry seed in storage and another generation develops. So "buggy" beans and cowpeas steadily grow more useless. Field pea weevils, however, do not lay eggs upon peas in storage and so, if infested peas are kept in a tight container for two seasons, all adults will die and no grubs will be present.

"Buggy" seed which is not too badly eaten will germinate, as the grubs eat only the cotyledons, not bothering the embryo. However, the "buggy" seed spreads adult beetles over the field and they lay eggs when the pods form. When a crop is harvested all refuse should be removed from the field, as beetles may live over in such crop residue. The seed should then be treated to kill the weevils.

Fumigation by means of carbon bisulphide is probably the best method for the average farmer or merchant. A tight container is necessary. Carbon bisulphide is a colorless liquid which quickly evaporates on exposure forming a gas heavier than air. This colorless gas is highly explosive and so must be handled without fire being near. One to two pounds per 100 bushels of seed should be used. The amount within these limits depending on the tightness of the container. The liquid should be poured over the seed and the container covered and left stand from 24 to 48 hours. The fumigated seed when well aired will not smell and is not harmed for food. They germinate as well as before fumigation.

Another treatment is by heat; 131 degrees Fahrenheit for one hour kills all larvae and adults if the seed is spread out. Longer time is required if the seed are not spread out. Seed so treated will not germinate. Losses from weevils may then be lessened, first by planting weevil-free seed on clean land. If weevils are known or suspected to be in the harvested crop, treat immediately.

The man who thinks he can grow a crop of corn and a crop of weeds in the same field has too large a cavity in his brain box.

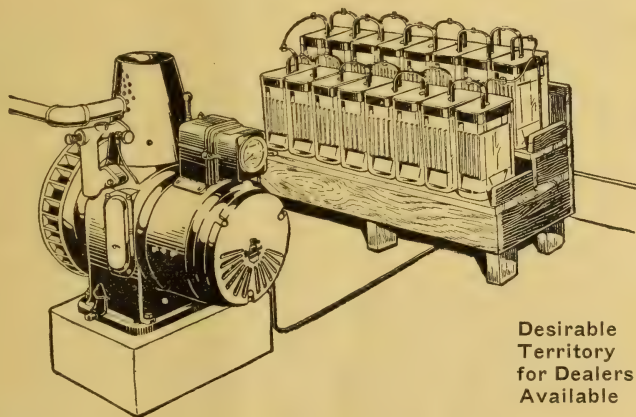


A Complete Electric Light and Power Plant for Farms

Its light brightens homes;
its ready power lightens
labor and saves time.

The Willys-Knight sleeve-valve engine improves with use. It burns kerosene, gas or distillate; self-starting, self-running, and self-stopping. Built by the world's largest manufacturers of motor car starting and lighting systems.

*Power and
Light
with the
Quiet
Knight*



Desirable
Territory
for Dealers
Available

INDIANAPOLIS WILLYS LIGHT CO.

Distributors for Central and Northern Indiana.

144-146 W. VERMONT ST.,

INDIANAPOLIS, INDIANA.

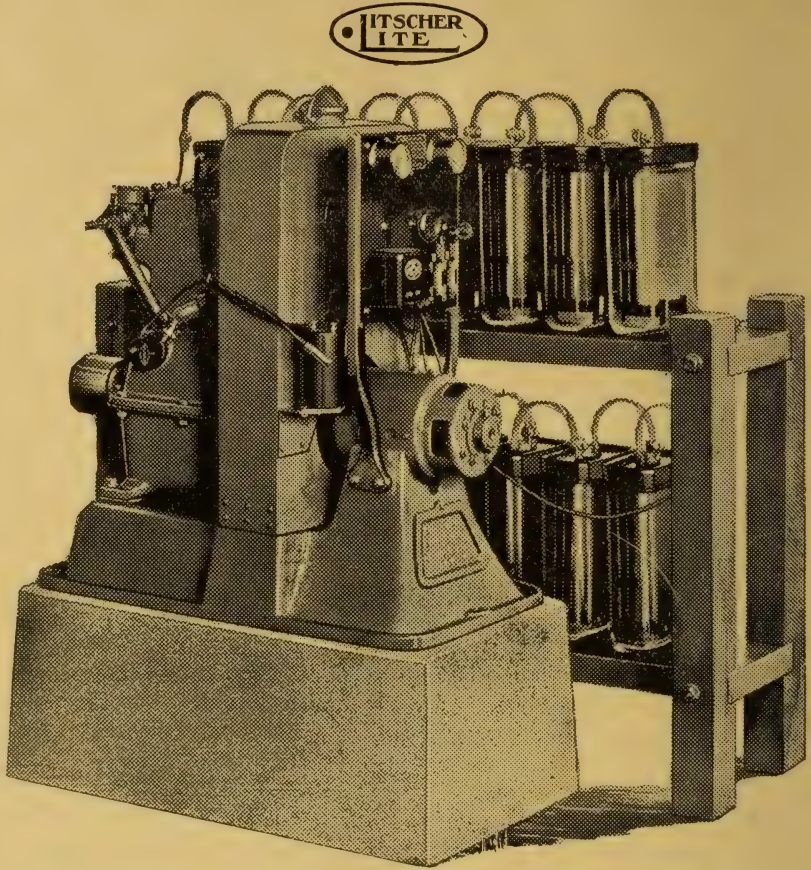
GILMORE M. HAYNIE & CO.

Distributors for Southern Indiana.

901-909 MAIN ST.,

EVANSVILLE, INDIANA.

The Willys-Knight Sleeve-Valve Engine



The **Litscher Lite** Plant is started by a push of a button, and runs on kerosene. One gallon of kerosene will run a **Litscher Lite** Plant for several hours.

The **Litscher Lite** Plant has two full H. P. in excess of its dynamo requirements. When the dynamo is idle, four H. P. are at your command for running any belt driven farm machinery. In other words the **Litscher Lite** Plant is an electric lighting plant and a stationary power plant combined.

Litscher Lite will operate electrically or by belt transmission any labor-saving device in house or barn.

The Varney Electrical Supply Co.

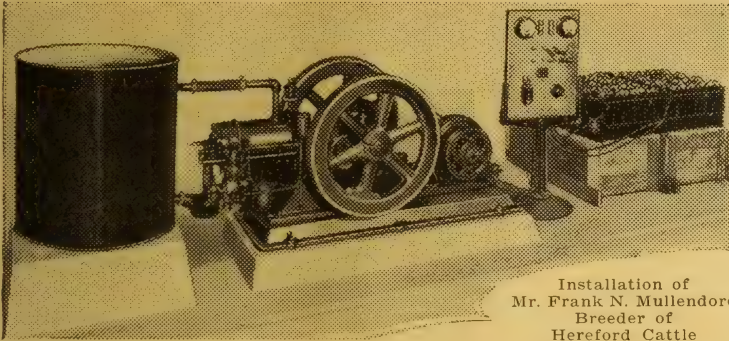
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Mr. Frank N. Mullendore
Breeder of
Hereford Cattle
Franklin, Indiana

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And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory Service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

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From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

Send for Complete Information

There is a Swartz Electric Power and Light System of proper size and voltage to meet your individual requirements at minimum cost. Ask for your copy of the Swartz Catalogue.

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Oldest Exclusive Makers.

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Quality Goods Direct From Factory



WE SAVE YOU MONEY

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*Satisfaction guranteed
or money refunded.*

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Put Up Your Own Indiana Silo

THERE is no need to go without the silo you need next fall because skilled help is scarce and it's hard to get anyone to erect it for you. Buy an Indiana and put

it up yourself. Any farmer can follow the simple directions we give for putting up the Indiana. You can have your silo up and ready when you want it.

Seventy-five thousand American farmers have bought the Indiana Silo and hundreds of them have bought again and again, until some now own as many as 15. They find that the Indiana is the best and most practical silo, more than pays for itself, every year. It makes better sil-

INDIANA SILO

age, allows less waste, stays in better condition and lasts longer.

Long experience, large purchasing power, and a business conducted on a large scale enable us to give a bigger value for every dollar than you can get in any other silo. Ask Indiana owners.

And our terms are so liberal the silo will almost pay for itself before the buyer has to pay for it. Write for catalogue, easy payment plan and early buyer's proposition.

**We are the largest manufacturers of silos in the World.
Agents wanted in every county.**

The Tractor You Can Use Every Day

INDIANA ALL-ROUND TRACTOR

"The World's Tractor"

THIS one-man, single-unit tractor works not 25 or 30 days a year but as many days as you now use your horses for field work. Plows as much as two good horse teams, cultivates, pulls harrows, discs, drills, rollers, mowers, binders, potato diggers and orchard tools.

There is no riding implement that it does not hitch to. Numerous users have eliminated horses entirely in farm work. Excepting for the plow it uses the horse tools you already have without expensive hitches. One man does the work, riding on the implement. The Indiana tractor weighs no more than a farm team. There is no excess

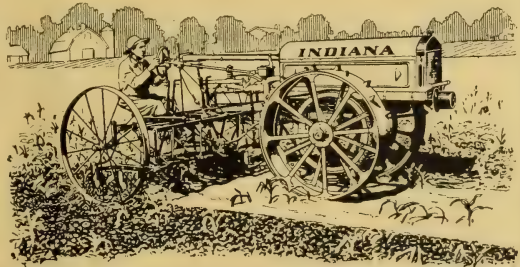
weight to drag around and no waste of fuel. The Indiana does a year's work of four horses at a gasoline and oil cost, that is less than half the cost of feeding and keeping the teams for a year. Farmers who have big four-wheeled tractors are now buying the Indiana to work their row crops and prepare the seed bed when the ground is too wet for a heavy tractor to work on it.

Write us now for book of pictures made from photographs showing the Indiana Tractor actually doing all the work that horses and mules do on a farm. Biggest dealer proposition ever offered on a tractor.

The Indiana Silo & Tractor Company

Largest Silo Manufacturers in the World

57 Union Bldg. Anderson, Ind.
57 Indiana Bldg. Des Moines, Iowa
57 Silo Bldg. North Kansas City, Mo.
57 Live Stock Exchange Bldg. Fort Worth, Texas.



Tractor Proves Its Worth

By Prof. Wm. T. Aitkenhead.

Head Farm Mechanics Department, Purdue University.

The tractor comes as the climax to the mechanical development which for the last seventy years has been expanding year by year on American farms. Small wonder that Prof. Ogg, of the Scottish Agricultural Experiment Station exclaimed on his recent visit to Indiana, "My! You do so many things by machinery here in the States."

"When all men agree, progress weeps," Thomas Edison is quoted as saying that the horse is only able to turn two per cent of the energy contained in his food into work, while the secretary of the Horse Breeders' Association states that the draft horse is the most economical source of farm power. It is probable that over ninety per cent of farm power is still derived from horses, but crediting each tractor with displacing three horses, it is a reasonable estimate that twelve to fifteen thousand farm horses have been displaced by tractors in Indiana. As farmers acquire confidence and gain skill in caring for tractors they will be purchased in ever increasing numbers, especially as season by season a nearer approach to mechanical perfection is being attained. For the man with mechanical sense, the dependable tractor is now here.

After two seasons with his tractor a Carroll farmer has planned to work his 200 acre farm in 1920 with a tractor, a power cultivator and one team of horses, manned by himself and one assistant. "He had better begin now and pray for a dry spring," was the comment of a pessimistic one who foresaw a fine assortment of clods ahead of the tractor farmer if the machine were worked on wet ground. With extension rims and the ground fit to work, a tractor below six thousands pounds, will not injure the ground, and should it happen that there are chronically wet spots a purchaser should foresee this and provide himself with a tracklaying tractor. Last year at Evansville after a week's continuous rain a tractor of this type plowed about five rounds, then hitched to a disk and cultipacker and went right over the plowed

ground with no inconvenience whatever. Horses under the same conditions would have punched the ground full of water logged holes.

The farm machinery men have never yet failed the farmer, in fact they have kept about three laps ahead of the demand so it would be idle to predict failure for motorized farming. One by one the obstacles are being overcome so it is not rash to anticipate a machine which will supply both tractive and belt power under any reasonable conditions.

LaFayette Milling Co.

Manufacturers of the following
brands of fine

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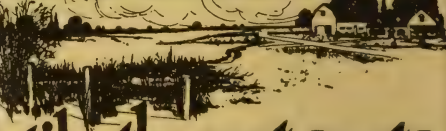
"LAFAYETTE MILLING CO.'S
BEST"

"SILVER MOON"

"WEDDING CAKE"

"SNOW FLAKE"

Put the idle acre to work



tile the wet spots

GET RID OF THE SURPLUS WATER

Make the ground porous. Allow the
fertilizing elements to get into
the sub-soil.

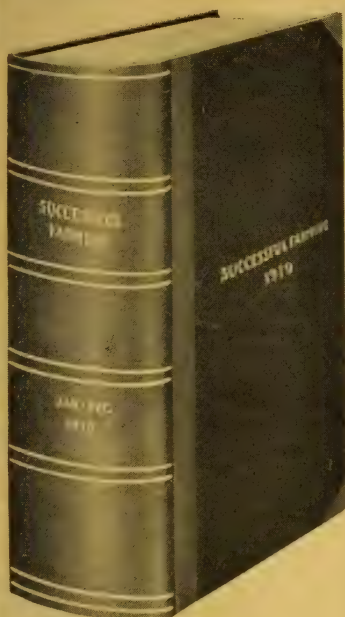
Use Well Burned Clay Tile.

For information write

Indiana Drain Tile Mfrs. Assn.

211 Hudson St.
Indianapolis, Ind.





This Book is in Your College Library

A bound volume of Successful Farming for 1919 is in your College Library. It was put there so you might have the opportunity to refer to it whenever you wished. A complete index is furnished with the book so you can readily locate the articles on any subject in which you may be interested.

Successful Farming is very much interested in the development of agriculture, and in the progress of agricultural students. We desire to co-operate in every possible way with the agricultural colleges. It is a pleasure to report the accomplishments of the agricultural colleges and state experiment stations to our large army of farmer readers.

What This Book Contains

This book is almost a complete resume of agricultural progress during the year 1919. It contains hundreds of helpful articles and suggestions for farmers and farm housewives. The articles are written by our editors, by agricultural college men and by readers of our magazine. Our editors spend a great deal of their time on the farms of our subscribers collecting material for articles for the benefit of other farmers. Successful Farming is edited for the man who farms 10 acres, 100 acres, or 1,000 acres. Each issue contains special departments for farmers, for their wives and for their children. Our purpose in sending this volume to your college library was so that students might have access to the information it contains. We hope you will use it freely.

If we can be of any other service to you at any time, be sure to write us.

Successful Farming

The Farmers' Service Station

E. T. Meredith, Publisher
110 Success Bldg., Des Moines, Iowa

Service for Farm Folks

Successful Farming is exerting every effort to persuade farm boys and girls to attend the agricultural colleges in order that they may have every possible chance of future success. To accomplish this result, Successful Farming loans money to farm boys and girls so they may get a start for themselves, encourages organized club work, even to the extent of offering many valuable prizes, and publishes the Rural Schools Bulletin, which is sent free to teachers and helps interest farm boys and girls in the study of agriculture. We want you to become fully acquainted with our magazine and its service departments. If you wish to receive current numbers, we shall be glad to receive your order. The subscription rates are reasonable—three years for \$1; one year for 35 cents. Sample copy on request.

SUCCESSFUL FARMING

110 Success Bldg., Des Moines, Iowa

- ☐ Enclosed find \$1 for which send me Successful Farming for three years.
- ☐ Please send sample copy of Successful Farming.

Name.....R. F. D.....

P. O.State

Producer?—Land or the Man

Every farmer is always on the lookout for ideas which will increase the corn yield with as little extra effort as possible. Too often in our search for some new method we neglect to study the details, and well known established principles which are the foundation of the corn crop.

Of course you remember how you had to plow around that wet spot in the corn field that last time, or leave that strip of land to dry while you plowed the drier ditched portion of the field. It was an inconvenience and an expense, and at the time you vowed that a string of tile would be put in as soon as the season's crop was off, but the wet, soggy spot is still there this year.

It always requires more labor and effort to break the clods and establish a good seed bed in these wet places and often the whole field is in condition for planting except the cloddy strip which needs tile. An extra day is spent in

preparation, a warm rain comes, just the thing for the corn if it were planted, but it is not. If it is in the ground and a wet period comes, the wet portion will come up with that pale yellow color, that is, if it escaped rotting. On the well drained portion there is an entirely different appearance.

If we really are sincere in wanting to raise greater yields, with less labor and expense, and more profit, it is often well to lay a few tile to carry off the surplus water.

When the rows are just a faint line of green we stroll across the field to see how it is coming and whether the cut worms are working on it. There is a sort of a thrill if we find every hill with three thrifty green stalks. If, however, we failed to shell the kernels from the tips and butts and did not grade the seed according to size, nor have the planter in perfect adjustment we find a hill of five, a hill of two, a hill of none, a hill of three

SOY BEANS

WE specialize in Soy Beans and can at most times furnish all varieties. Soy Beans are quite scarce this year and we would advise early buying. Ask for our Soy Bean Chart, "Friendly Workers of the Soil", and Field Seed Book. These are different and you will enjoy reading them.

O. M. SCOTT & SONS CO.

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MARYSVILLE, OHIO

Manufacturers of
Indiana Farm Wagons,
Farm Trucks and
Extra Boxes

State Agents For
Master Trucks
1½ to 5 Ton Capacity
Winton and Scripps-Booth
Six Cylinder Automobiles
Write For Prices

The Indiana Wagon
Company

South Street and Belt Railway, LaFayette, Indiana

and so on. All of this, because it is impossible for a planter to make uniform hills with small, large and medium kernels all mixed together.

When we dig down to see why some hills are missing, we may find that they have never sprouted or have made a feeble effort and failed. Our seed corn looked so bright and seemed to be in such good condition before it was shelled for planting that we just thought it must grow, or work was so rushing that time was not taken to test the ears. Consequently several weak ears were planted and a few which were entirely dead, each dead ear thereby causing a loss of many hills and a few bushels.

Besides these, a few diseased ears were planted which will show up later in the season. It pays to use some rainy day for testing the corn before we take a chance and plant it untested.

A definite written plan for the crop's and season's work, including the details, will make more ears in our field by reminding us of the little things we must do in order to have more bushels.

MONEY IN POULTRY AND RABBITS

We show you where to market all you raise at a profit. 62-page, illustrated book, 50 cents. None free. Co-operative Supply Co., Dept. 10, St. Francis, Wis.



Our No-Freeze Stock Fountain is a wonder. It keeps the water warm in winter, cool in summer. Can move your water supply to any part of the farm.

Write for catalogue today.

J. O. CLARKE TANK CO.
N. Walnut St., Crawfordsville, Ind.

IVAN S. GLIDEWELL
Spotted Poland Hogs

VERA H. GLIDEWELL
White Rock Chickens

Sunny Brook Stock Farm
PLAINFIELD, INDIANA

Feeding of Texas Bred Hereford Baby
Beeves a Specialty.

REARING CHICKS.

It is not generally known that over 20,000,000 chicks die in the State of Indiana each year and that this is due chiefly to poor management during brooding season. Where a hen is used to rear the chicks a coop, at least two feet square, should be provided which will allow room for both hen and chicks. Provide it with plenty of ventilation and protection against weather and enemies. A small yard should be provided to permit the hen some liberty without giving her free range. The hen should be fed whole corn or other large grain which the chicks cannot eat. The coop should be cleaned regularly and moved to fresh, clean ground frequently.

When a brooder is used, it should be cleaned thoroughly and disinfected. Run it several days and nights before the eggs are due to hatch, so that the operator may become familiar with the operation and repair any defects or breaks. The floor should be covered with at least half an inch of fine sharp sand, over which is spread a light litter of fine cut straw, alfalfa, or clover hay. Before the chicks are removed from the incubator they should be "hardened off," which consists of gradually reducing the temperature and increasing the ventilation during the 24-36 hours previous to removing them. When the chicks are taken from the incubator they should be carried in a covered box or basket to prevent their being chilled. The hover temperature should be around 100° F. If the chicks tend to pile up or chirp constantly the heat is insufficient. If they go too far from the source of heat, it may be too hot for them. When the chicks are comfortable they sprawl out over the brooder floor. "Chicks must not be fed before 48 hours from the time they are hatched." Sour milk is the best feed with which to start the chicks. The first drink should be given when the chicks are removed to the brooder. Scratch grain should be started after the first 48-72 hours have passed.

Purdue Chick Ration.

Scratch grain:

6 lbs. fine cracked corn.

(Continued on page 430)

Get Bigger Milk Checks

How?
Simply Feed your cows
International Special Dairy Feed — the feed that
lowers your feed bill and increases the milk flow. An army of
farmers in every dairy section of America recommend and use it.

International Special Dairy Feed

"Makes More Milk"



There's only one best method to feed your herd. There's only one best method to get the most milk, and that's the International way. This fact has been proved by practical, common-sense dairymen who have tested International Special Dairy Feed over long periods. And these tests proved conclusively that this unusual feed produced more milk than any other similar feed on the market.

Order a Trial Ton from Your Dealer Today

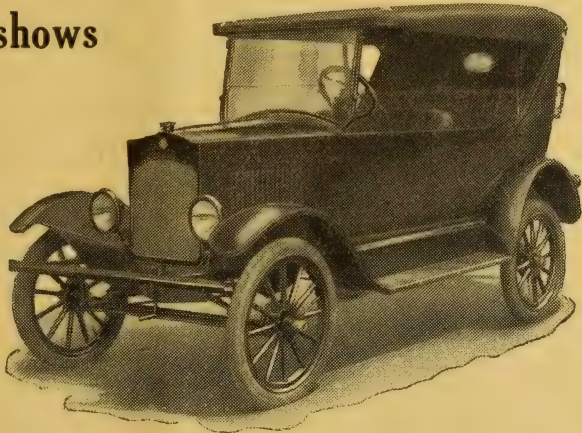
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the reason

We have
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Autowa includes besides the beautifully finished body a special honey-comb radiator, front and rear bumpers with tire carrier, full crown fenders, skirts, top and windshield. This body has the same material in it that most expensive cars have and everything to make you have a car of quality.

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Auto 51-730

ALUMNI NOTES

(Compiled by G. A. Ross, '16, Alumni
Secretary.)

1893.

Herman C. Beckman, A., is Department Manager of Special Machinery with the DeLaval Separator Company, of Chicago, Ill. His mailing address is 6828 34th St., Chicago.

1904.

Chas. S. Rauh, A., is with the E. Rauh Sons Fertilizer Company, of Indianapolis, Ind.

1909

Geo. M. List, A., is connected with the Colorado Agriculture College, at Fort Collins, Colo.

1912.

J. M. McHaffie, A., is teaching in the high school at Greenfield, Ind.

George M. Spencer, A., is farming near Monticello, Ind.

1913.

G. A. Hanna, A., is farming near Plainfield, Ind.

Horace E. Knapp, A., may be addressed R. R. No. 7, Frankfort, Ind.

1915.

S. W. Greene, A., is director, Costal Plain Experiment Station, with the U. S. Department of Agriculture, Bureau of Animal Husbandry. Mr. Green may be addressed at McNeill, Miss.

George C. Knox, A., has charge of Orchard Management Work in Indiana School for Feeble Minded Youth at Ft. Wayne, Ind.

S. A. Stewart, Jr., A., is in the Sales Department with the M. C. Peters Mill Co., of Omaha, Neb.

1916.

Gilbert P. Walker, A., is connected with the Agricultural Experiment Station at Purdue University.

1917.

Herbert W. Crowe, A., is living near Webster, Ind.

Glenn L. Reed, is farming at Brook, Ind.

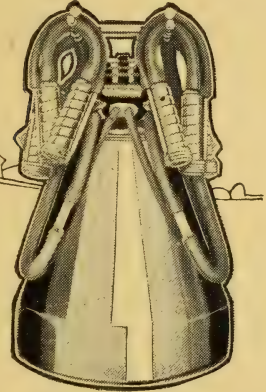
E. E. Privett, A., is Vocational Agricultural teacher in the high school at Morristown, Ind.

B. P. Stonecipher, A., is Associate Professor of Truck Crops and Floriculture with the Iowa State College at Ames, Ia.



S. E. VAN SLYKE

Two Men With the Perfection Milker Take the Place of Five Men Milking by Hand on S. E. Van Slyke's Farm.



WHEN asked: "How many cows can a milking machine take care of in an hour?" S. E. Van Slyke, a practical dairyman who has owned a Perfection Milker for four years said: "That all depends on the cows and the operators of the milker. We find that two men can milk as many cows per hour as five or six did by hand and do it much more easily. The Perfection sure is a time saver for the farmer."

Better Than Hand Milking on A. R. O. Test

"The first winter we used the machine we tested a number of two-year-old heifers on seven-day A. R. O. work. As they had never been milked before we did not use the milking machine on them until the test was completed. You can be sure we were both surprised and pleased to find that their milk flow increased when the Perfection was put on them.

"As they were milked four times a day for some time with the Perfection without any udder trouble, we are confident the machine will not hurt the cows as long as they are rightly used. We hope to do considerable A. R. O. work in the next year and will use the Perfection for all of it."

Names, Addresses and Catalog Sent Free

The many satisfied owners are the best recommendation for the Perfection. We will be glad to send you Mr. Van Slyke's address together with the names and addresses of many other dairy-men to whom you can write. We will also send you FREE, "What the Dairyman Wants to Know," the book that answers every question about milking machines. Write us today.

Perfection Manufacturing Company

2146 E. Hennepin Avenue

Minneapolis, Minn.

The Perfection is the Milker with the Downward Squeeze Like the Calf.

PERFECTION MILKER

MURPHEY-BIVINS CO.
PRINTERS
LA FAYETTE, IND.

Letter Heads, Office Supplies
 Social Stationery
 Visiting Cards
 Announcements
 Invitations
 Programs a Specialty

**STOCK SALE CATALOGS A
 SPECIALTY.**

REARING CHICKS.

(Continued from page 426)

4 lbs. fine cracked wheat.

2 lbs. "steel cut" oats.

Dry mash:

2 lbs. bran.

2 lbs. shorts.

$\frac{1}{4}$ lb. carcoal.

Sour milk or buttermilk—all they will drink.

Green feed—all they will eat.

Grit (or sharp sand) and granulated bone—before them at all times, hopper fed.

The ration may be varied to suit local conditions and feed prices. The amount of feed used will increase as the chicks grow older.

Both men and women need to be good mixers—a man in his business, and a woman in her kitchen.

Orange county farmers use about 1,000 tons of fertilizer each year, according to the reports received on an inquiry sent out by County Agent F. W. Frank.

Boost Your State and Help Purdue

E. RAUH & SONS FERTILIZER CO.

Union Stock Yards

INDIANAPOLIS, INDIANA

Manufacturers of

**HIGH GRADE MIXED FERTILIZERS
 ACID PHOSPHATE**

Importers of

Nitrate of Soda

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WE ALSO MANUFACTURE

Digester Tankage 60% & 50% Meat Scraps for Poultry

AGENTS WANTED IN UNOCCUPIED TERRITORY.

WE SOLICIT YOUR PATRONAGE.

Fordson

TRADE MARK

Farm Tractor

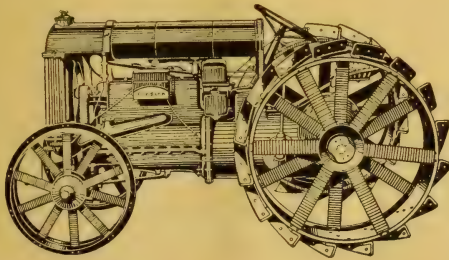
On the farm, just as in the big factories in the city, the machine way of doing things is quicker, easier, better. The Fordson way is the machine way of farming. It will help you to raise more per acre, thus increasing your income. It will help you to do more work in a day. It will lighten your work; and make your work easier for you.

The Fordson doesn't stop with the field work. It is a flexible, all around power plant, ready for use during the entire year, and at a remarkably low cost of upkeep. And there's work for the Fordson on every farm every day in the year.

The Fordson is very simple to operate—a school-boy can drive it.

The Fordson dealer will be glad to explain it to you, and tell you why it is a profitable investment.

Made by Henry Ford & Son and distributed by



INDIANA TRACTOR COMPANY

1327 E. WASHINGTON STREET,
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WRITE FOR DESCRIPTIVE BOOKLET



Spring Styles

— FROM —
**Society Brand
Stein-Bloch**

— and —
Michaels-Stern

are ready for your inspection.

SEE OUR WINDOWS

THE HUB

Ben and Joe Hirsh

West Side Square

A Special Service for Inventors

All inventions are but the outgrowth of an idea. IDEAS are the foundation of success, but they must first be made realities and put to work before they have any real commercial value.

IDEAS of merit plus our SERVICE means success for the originators. Our success can only be built upon the successful outcome of our client's ideas.

Farm-Power Machinery a Specialty

We have a corps of high class engineers and draftsmen and are in a position to Engineer, Design and Build Machinery and Projects of all kinds.

GLEN-HART ENGINEERING COMPANY

833-834 Occidental Bldg., Indianapolis, Ind.

Telephone, Main 3728.

K. R. Clendening

L. R. Hartley

REARING THE BABY CHICKS.

(Continued from page 380)

lowered and artificial heat done away with, so that they can be put on range in a cool house when about eight weeks old. If they are not gradually accustomed to do without heat, many will die from the sudden change. When put on range the cockerels should be separated from the pullets and confined in the fattening pens.

TEACHING THRIFT TO BOYS AND GIRLS.

(Continued from page 394)

not much to show for money spent and nothing had been given to church or philanthropy. After a discussion of the problem with her son they made out a plan or in other words budget for the use of the next 25 cents. It took the following form:

I expect to receive	25
I expect to save for W. S. S.....	05
I expect to spend—school.....	05
Self	10
Sunday School or Orphans' Home.....	05

This was checked up by keeping an account of the money spent. They used the following form:

Balance on hand	—
Amount received	25
Received from Mother and Father.....	—
Amount saved	05
Amount spent	05, 10 and 05
Spent for: Pencil, movie, Sunday School	—

There were no restrictions placed on the five cents for school or the ten cents for self. In this way the boy gained

Carson's Drug Store

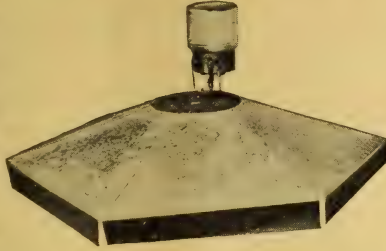
KODAK FILMS
DRUGS AND
SCHOOL SUPPLIES

306 State St., West LaFayette

No-Cold Brooder Stove

BLUE FLAME WICKLESS BURNER

No cold brooder stove in the morning if you use the No-Cold



The Greatest oil burning brooder stove ever invented

The No-cold Brooder Stove is the only oil burning stove that will hold the heat up to required temperature during the night. It will hold the temperature as accurate as an incubator. The needle is constructed so that flow of oil never reaches a danger point. Burner is absolutely wickless and will burn for weeks without clogging or sputtering. Perfect circulation of air which is very essential in raising strong healthy chicks. Stove has cast metal top. Glass Oil Fount. Strong and rigid as a coal stove. Burns kerosene oil. Broods from 100 to 600 chicks. Write today for illustrated catalogue.

Electric Hen Incubator

Hatches as strong chicks as the hen. Three 100 per cent hatches by inexperienced operators last spring. We also list Poultry Supplies. Send for complete catalogue.

INTER-STATE SALES CO.

TIPTON,

Dept. B

INDIANA

Agents and Dealers Wanted.

HAYWOOD PUBLISHING COMPANY

LaFayette, Indiana



If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



*A Stationery and
Office Supply
Department,
Heavily Stocked, is
Operated in
Connection*

pleasure in spending the fifteen cents as he pleased. A part of the allowance was not only saved but invested and five cents were spent for some other purpose than self. If these business principles are followed we have the foundation laid for the "good management of the business of living."

The following bulletins published by the United States Department of Agriculture and the United States Treasury Department give many helpful suggestions for boys and girls.

"Ten Lessons in Thrift."

"Is Thrift Worth While Mr. American?" Thrift Leaflet No.....	1
"Seven Steps Toward Saving".....	2
"Teaching Thrift to Your Children".....	19
"Thrift Standards for Boys and Girls".....	20
"Thrift on the Farm".....	17

THE PINK AND GREEN APHID OF POTATO.

(Continued from page 406)

may be easily seen that the rate of increase is enormous.

Degree of Infestation.

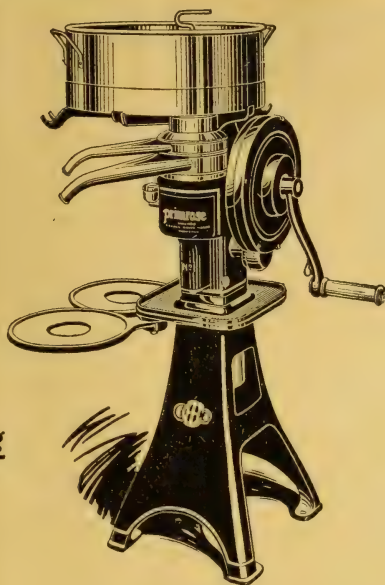
The number of aphids on a few plants was obtained by counting. A small tomato plant with seven leaves contained 1,237 aphids. Plant No. 2, a large spreading tomato plant with 12 stocks, contained 34,668 aphids, and a third contained 25,750 aphids. These numbers are amazing, but the most amazing feature of the case is that only 456 females would be capable of infesting the second plant in two weeks. They have been found in badly infested fields from June until as late as killing frosts in October.

Host Plants.

The following were found to be heavily infested: Potato, tomato, eggplant, pepper and sunflower. Those commonly though not heavily infested were, Jimson weed, ragweed, sweet potato, canna and hollyhock. Those plants not commonly infested were: Corn, beans, moth mullein, plantain, curly dock, smartweed, pigweed, turnip, apple and garden pea. A study of this list shows that this insect feeds on a wide variety of plants and this makes control measures much more complicated. It is also evident that proper weed control is a vital factor in

The 1920 Primrose at the 1918 Price

A study in manufacturing
and Farm Equipment
Economics



Sugar and baby shoes, underwear and eggs, coal and automobiles—prices of these things and other things have climbed and climbed since Armistice Day. Has the price of anything on earth stayed down?

Yes! Primrose!

Primrose Cream Separators are selling for the price of 1918—selling for slightly more than the good old price of 1914—before the war days. Primrose popularity has grown so rapidly that the big production permits the maintenance of the low price.

To the analytical student, Primrose Cream Separator price stability presents an interesting study in manufacturing and farm equipment economics.

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the control of the lice, since they readily migrate to plants after spraying and they may soon be again badly infested.

The tender leaves of the tip of plants are first to be attacked and as the leaf develops the lice continue their sap sucking, devitalizing work, the edges turn downward and the leaf soon takes on the characteristic distorted shapes.

CONTROL.

Natural Enemies.

Fortunately, from the standpoint of control, this species is subject to attack by a number of natural agencies. Of these the internal parasites are very important. When attacked the aphid becomes sluggish, attaches itself to the leaf and dies. The body becomes distended, takes on a light brown color and soon a round hole resembling a trap door appears through which the parasite escapes. Four species of very small insects are known to attack these aphids.

Insects are very important enemies of these plant lice as nine species of lady beetles help in reducing the pest. An adult of one species was found to eat

(Continued on page 438)

Over Forty One Million Dollars!

An enormous sum
—and yet,
large as it is—

We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the **SEVEN** largest Live Stock Commission Houses on the Chicago Market and we are also one of the **SEVEN** largest Houses on the Kansas City market.

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U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

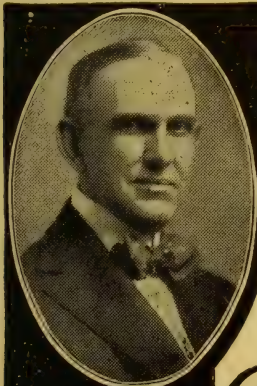
KNOX COUNTY ASSOCIATION WILL HELP COUNTY AGENT.

That the Farmers' Association of Knox county is back of the county agent work and is boosting for better agriculture in the county is shown by the business which the members of the association transacted at their last meeting. The association will buy a moving picture outfit for the use of County Agent W. J. Piggott, and equip it with both films and slides in addition to an addressograph, which will be put in the county agent's office. The association will also publish the county agent's records and has laid preliminary plans to take over the County Fair and make it a real agricultural display. In addition to this, the organization will finance the county corn show this year.

HANCOCK FARMERS OUTLINE EXTENSIVE YEAR'S PROGRAM.

An extensive program of work for the coming year has been outlined by the Farmers' Association of Hancock County and farmers co-operating with County Agent M. E. Cromer and the Association will conduct a campaign to improve the agricultural methods of that community.

Demonstrations in the following lines of work will be conducted by the county agent and the farmers co-operating: hogging-down corn and soybeans, smut control on wheat and oats, acid phosphate on corn, wheat and oats and poultry culling. A five-acre corn contest will be held, boys' and girls' clubs will be organized and in addition an effort will be made to conduct a county products show during the year.



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to Know
Facts**

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LET me show you how to solve the drainage, irrigation and soil washing problems at low cost. I'll show you how two men can now do more ditch work than 100 men by old methods. This is the year to save labor and do this work swiftly and efficiently. I'll show you the way. Write for the new book that tells the story.

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Cuts V-shaped ditch for open drainage, irrigation or tile any depth down to 4 feet, leaves smooth, hard sides. Also use it for back-filling tile ditches and holes. Perfect machine for cleaning old weed-clogged ditches. **All steel—reversible to throw dirt either side. Adjustable for narrow or wide cut. No wheels, cogs or levers to get out of fix. Lasts a lifetime.**

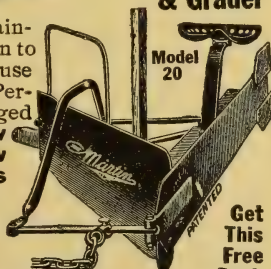
Farm Terracing

Builds farm terraces which stop washing of soil on rolling and hillside land and hold the water where it should remain; reclaims abandoned washed land; throws up dikes and levees; grades roads; works in any soil, wet or dry; 2, 4 and 6 horse sizes; large size fine for tractor. Needed on every farm.

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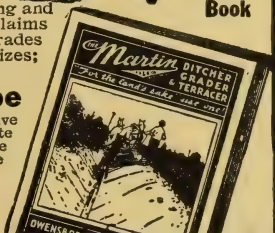
Chance of a lifetime to make big money the next five years. Here is crop insurance at a low cost. Write and find out how to make big crops sure. New free book on drainage, irrigation and terracing. Write for this and our proposition. Address W. A. Steele, Pres.

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Hansen's Danish Butter Color
Bulk, 1 gal. or larger

To properly ripen the cream for butter, and the milk for cheese and commercial buttermilk, use Hansen's Lactic Ferment Culture.

For sale at all dairy supply stores.

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Inc.,

LITTLE FALLS, N. Y. MILWAUKEE, WIS.
TORONTO, CAN.

Interesting treatise "The Story of Cheese"
by J. D. Frederiksen, free on request.

(Continued from page 436)

six aphids in 22 minutes and a well grown larva was seen to eat three in 12 minutes.

Also the larva of three species of *Syrphus* flies were found commonly feeding upon aphids.

The following birds have been found to eat the aphids: Chipping sparrow, quail, English sparrow and the hen.

A certain parasitic fungus disease has been discovered to attack the lice and kill as many as 2,570 of the aphids on the stalk.

Artificial Control (Spraying.)

It has been found that a spray of nicotine sulphate and soap applied to the under side of the leaves is the best artificial control. Use nicotine sulphate one and one-half to two teaspoonfuls in a gallon of water or about one part in 500 and use enough soap to form suds. The value of different soaps is of little importance. Two applications or more may be necessary and should not be more than three days apart. Thoroughness of application is absolutely necessary for success. Because of the wide variety of hosts, clean culture is impor-



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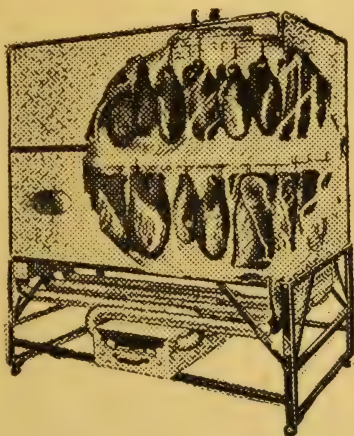
It is compact and can be taken through an ordinary door. Made in all sizes, ranging from two-hog capacity on up.

Can be operated from chimney same as stove and requires very little attention. Smoke goes through an air-cooled radiator before reaching meat, and can not overheat.

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Sectional View of the Eureka

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and profit by this knowledge they are able to prevent the regrettable losses of milk quality that are certain to occur unless the milk containers, machinery and utensils are kept sanitary, wholesome and clean.

So valuable is the use of this cleaner and so little its cost that no one engaged in dairying or any of its branches can well afford to be without the assistance it brings.

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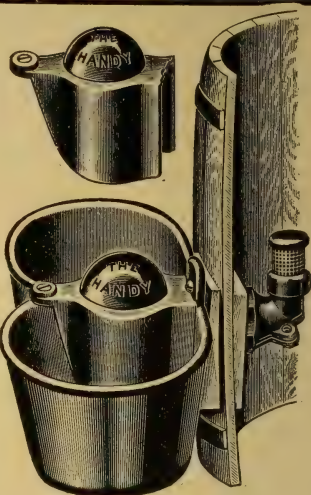
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"HANDY"

AUTOMATIC HOG WATERER

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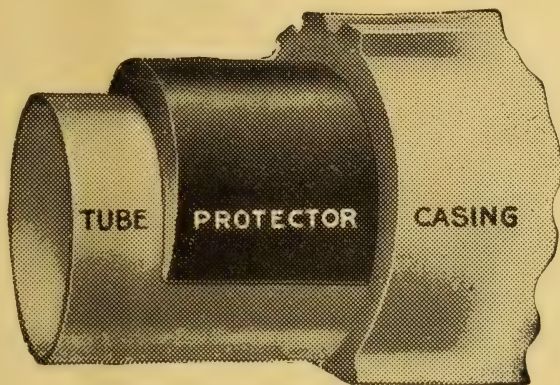
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PREVENTS BLOWOUTS Due to Over Infla-
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Jacob Bossung
302 State Street. West LaFayette

tant. Spraying at early stages of outbreak is important. With proper equipment, proper materials and thorough work, this aphid may be economically controlled.

CHURNS.

(Continued from page 408)

churns with a variety of special contrivances for stirring the cream. The first step, beginning with the churn when the cream was placed in a vessel and shaken until churned, was the introduction of agitators into the vessels or churns. The next step brought into existence the revolving hollow barrel and box churns operated by hand. In due time these churns were constructed so as to be power driven. The first step, beginning with the worker when the butter was worked by hand, was to introduce a wooden paddle to take the place of the hand as a butter worker. Then came a butter-worker consisting of a table or special apparatus provided with rollers and operated by hand. Soon this worker was constructed so as to be

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power driven. Finally came the step, following the development of both the churn and worker, when the churning and working processes were combined to form the modern type of churn, termed the combined churn and butter worker.

The combined churn and butter worker has many advantages over the old-style churn and worker. The butter need not be handled from the time it goes into the churn as cream until it comes out ready to pack. Greater control over temperature during the working process is possible. In fact the whole working process can be better controlled and thus a more uniform product put out. It is especially adapted for use in large creameries, although there is a wide range of sizes, the smallest of which will work ten pounds of butter, while the largest will work fourteen hundred pounds. This type of churn provides a most efficient, rapid, sanitary, and economical means of producing a uniform product in large or small quantities.

Idealism is just stubbornness that doesn't know when it's bed time.

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The PURDUE AGRICULTURIST



MAY, 1920



Vol. 14 No. 8

What a Hog Needs For Quick Growth

The right materials and correct quantity of each, are just as important in building a hog as in building a house.

For the frame. The growth of the hog depends upon the growth of the frame. The alfalfa flour and tankage in Pig Chow build a large frame.

For flesh. Elements for flesh, blood, hair and hide must be liberally supplied. Tankage, linseed meal and gluten feed in Pig Chow supply these elements.

For fat. Fat must be put on as the hog develops. Molasses, hominy, ground corn and gluten feed make fat, heat and energy.

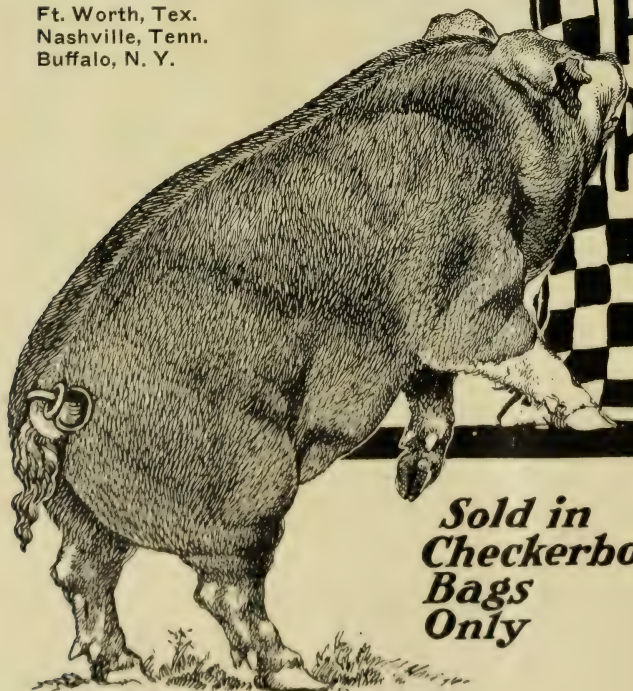
Purina Pig Chow finishes hogs in twenty to thirty days less time than the average ration, and makes

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costing \$3.00 to \$6.00 less per 100 lbs. to produce. These are demonstrated facts. Get the data. Use Purina Pig Chow on your next lot. If your dealer should be sold out, write to

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**Don't take chances
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Serum and Virus

The Single Bled from the Swine Breeders Pure Serum Company saves your hogs. Experience has proven it to be **the best**. We can supply your wants at once.

Prompt attention given to all orders.

Don't wait until you get disease in your herd. Save trouble and loss by treating your pigs now while they are well. Write.

**Swine Breeders Pure
Serum Company**

THORNTOWN, INDIANA



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Home Economics and Goodyear Belts

Domestic Science is transforming the work of the farm wife as completely as engineering and soil chemistry are advancing that of the farmer himself—and to the same ends, that drudgery may be replaced by power's economy of time and labor.

The Farmer's Wife today has conveniences and aids to homemaking comparable with the farmer's power equipment for increased yields and lower costs. Interurbans and telephones have brought her neighbors next door to her. In her automobile, over the new good roads, church, school, shops and theatres are only a few minutes away.

Her home has electric lights and furnace heat. Her sewing machine is motor-driven. Her churning, washing and ironing are done by power machines. In her daily work, power is as commanding a factor as in the field and on the road.

And dependable belting is as essential to the efficient operation of the farm-

house power machines as it is to the giant separators and tractors. The same function—transmission of power—determines the economy of the belt regardless of size or use.

Made of the same stock, and built with the same careful intent to protect our good name, the Goodyear Klingtite Belt on washer, churn or lighting plant returns the same trouble-free, full-powered, long-lived service as the Goodyear Klingtite Belt on the threshing machine.

A Goodyear Klingtite Belt needs no breaking in. It requires no belt dressing. It is waterproof. It holds the pulleys in an even grip and works with a free-swinging action that favors the bearings of the lightest engines. These qualities which no ordinary belting affords make the Goodyear Klingtite "the best help on the farm." Students and teachers of agriculture are sent copies of the Goodyear Farm Encyclopedia on letter request to The Goodyear Tire & Rubber Company, Akron, Ohio.

GOOD YEAR

 KLINGTITE BELTS



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Entered as second class mail matter December 4, 1906, at the Post Office, LaFayette, Ind., under the Act of Congress of March 3, 1879.

Subscription Price, Fifty Cents Per Year.

Advertising rates sent on application.

THE BEST HE CAN

It's nachural enough, I guess,
When some gets more and some gets less,
Fer them that's on the slimmest side
To claim it ain't a fair divide,
And I've knowed some to lay in wait
And get up soon and set up late
To ketch some feller they would hate
Fer goin' at a faster gait.

The signs is bad when folks commence
A-findin' fault with Providence
And balkin' 'cause the world don't shake
At ev'ry prancin' step they take.
No man is great till he can see
How less than little he would be
Ef stripped to self and stark and bare
He hung his sign out everywhere.

My doctrin' is to lay aside
Contentions and be satisfied;
Jest do your best, and praise or blame
That follers that, count jest the same.
I've allus noticed great success
Is mixed with trouble more or less.
And it's the man who does the best
That gits more kicks than all the rest.

—By *James Whitcomb Riley*

THE PURDUE AGRICULTURIST

VOLUME XVI

MAY, 1920

NUMBER 8

The Indiana Home Special

By T. R. Johnston,

Head Information Department, Purdue University.

ONE of the biggest pieces of educational work ever undertaken by the agricultural extension department of Purdue University has been the campaign for the installation of running water systems in every home in Indiana. The campaign has been launched by the running of a special train known as the Indiana Home Special Train over New York Central Lines in Indiana from March 15 to April 16. It is to be followed up during the summer by organized campaigns in various counties in which home tours will be made, special weeks set aside to make a concerted effort for home improvement, and other features taken up to encourage the installation of water systems and other conveniences for the farm.

On the itinerary of the train were 86 towns and cities in all parts of the state and more than 30,000 persons passed through the three coaches filled with equipment which conveyed ideas of home conveniences and labor saving devices for the farm home.

It is impossible to estimate the value of the running of such a train. Aside from the immediate effect and the help it has given to the thousands of farmers who are remodeling or building new homes now, the train has given inspiration to thousands more who will have new houses or homes of their own during the next few years.

While running water systems were featured on the train and the major part of equipment in the three cars drove home the ideas and helpfulness of the farm water system, lighting outfits and the many little conveniences for farm kitchens came in for their share of space and they attracted much attention.

The first coach entered by visitors to the train showed an electric power plant

which lighted the car, operated an electric water system which pumped water to a milk room and well equipped bath room. It also provided power for an electric ironer, a washer, separator and churn, all of which had individual motors and were controlled by a switch. Near the washer were two big stationary tubs, both of which had drains in the bottom, so that after the clothes were rinsed the water could be let out through the drain instead of the old fashioned way of heavy lifting and pouring.

This laundry feature especially took the eye of the women and thousands of them sought information about power washers and how they could be installed in their homes.

In the next section of the same car was shown a farm milk room. The automatic water system forced water through a hydrant to a sink in this room so that the milk utensils might be washed and scalded there, without being taken into the house. The water system also forced water through a cream cooling tank. In this room were the separator and churn, both operated by motors.

The next section of the car showed a bath room with water supplied by the air pressure tank for bath rub, toilet and wash basin. An electric heater brought out the fact that these were just as easily obtainable in the country as in town, if a farm power plant was in operation.

A septic tank which provided for sanitary sewage disposed on the farm filled the remaining portion of this car. Its workings and construction were explained by university attendants.

"Concrete is universally used for construction of the tank," said C. A. Norman, a member of the university staff.

"The walls are 5 inches thick and the top is made so that it may be lifted off after the dirt has been removed from it.

"The sewage is changed to a liquid in the first chamber of the tank and purified in the second chamber and tile lines. No chemicals are needed. Bacteria do the work.

"The capacity of the tank should be 50 gallons per person using it. There should be about 50 feet of loosely laid drain tile

a short distance away. The outlet may run either into a ditch or into a dead end. The farm garden is a suitable place to let it go, as the moisture from below will pay for the installation of the septic tank in a season by increasing the garden yield.

"The tank should be covered with about 18 inches of earth and the tile lines should be from 14 to 18 inches below the surface. Mineral matter should be removed from the septic tank about once in



Power simplifies the farm laundry work.

in the disposal system for every member of the family. An automatic syphon should be used to insure uniform distribution throughout the absorption system and to provide breathing spells for the bacteria working in the second chamber and in the tile lines. The liquid runs out into the tile lines and seeps away into the soil.

"If the soil is tight or impervious, gravel or cinders around the tile will let the water get away. Sewer tile with cemented joints should be used between the plumbing in the house and the tank. "The tank may be placed anywhere outside the foundation wall, and to save labor in installation, it should be run just

eight or ten years, although some of the tanks will go two or three times this long without being cleaned."

The mechanical details of installation of the plants, operation of the gas engines or electric generators and batteries were taken up in the next car, through the displays of individual plants and by the work of the lecturers. Three individual water systems with kitchen sinks attached and all the workings that would be necessary on the farm, attracted much attention as they forced water through hydrants in the sinks.

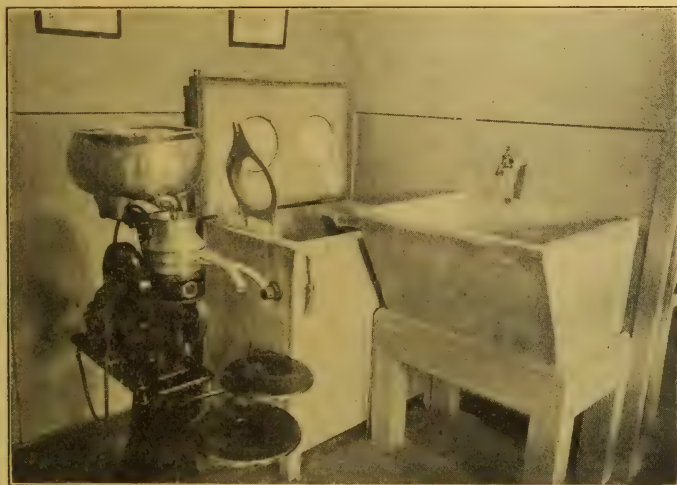
A complete power plant in this car to which was attached a vacuum cleaner, electric iron, toaster, hot plate, sewing

machine, etc., attracted considerable attention and evoked many questions from interested men and women.

The third car, which represented a miniature home, was also lighted by the power plant near the entrance. This plant provided current for an electric iron, washer, churn, etc., as did the plant in the first car. The kitchen attracted unusual interest because of the information presented there on the working

A model bath room was shown next to the kitchen, equipped as well as in most city homes. Then a well appointed living room, with fireplace, built-in bookcases on either side, good furniture, etc., drew much favorable comment from both country and city folk who went through the train.

The fourth car was fitted out as a lecture coach. An automatic lantern threw slides on a suitable screen and lecturers,



A corner of a milk room, with separator operated by motor.

heights of tables, pressure cookers, fireless cookers, hot water systems for the farm home, dish drainers, etc.

"Dish drainers will save at least a half hour to an hour or more a day, depending on the size of the family and the number of dishes that have to be dried. By using this and letting the dishes dry themselves, all the energy of doing it yourself may be saved. The dishes should be washed good, placed in the drier, plates and flat dishes in this compartment, cups, knives and forks, etc., here. The rack may then be placed in the sink or left on a drain board and the dishes scalded. They will dry within a short time and be as clean as if they had been dried with a towel," one of the women speakers in the kitchen explains.

The lecturer in the kitchen also cites the built-in cupboards and wall cases near the stove or sink so that the pans, pepper and salt, etc., may be obtained without walking across the room.

both men and women, explained various features of modern conveniences for the farm home.

No advertising from the train was permitted by any of the concerns which co-operated in arranging the display, but the mere fact that some of the largest lighting firms, water system manufacturers, and others co-operated with the university, railroad company, Indiana Farmers' Federation and Indiana Home Economics' Association in staging the campaign showed that they all realized the importance and far reaching effect of such a movement not only now but for years to come.

A Connecticut farmer who recently enrolled in the "better sires" movement is an example of the interest of men in improved poultry. He listed 30 cattle and 1,939 poultry—all of pure breeding. No other breeding stock was kept on the farm.

The Call for Rural Leadership

By Prof. O. F. Hall,
Dept. of Educational Sociology.

THE 1920 census returns show no abatement in the growth of our cities. A considerable number of the industrial centers have doubled their population since 1910. Approximately thirty per cent of this urban increase comes from rural districts.

ous war and other "drives" of the past three years have brought this fact to our attention in a new and vivid manner. It should also be said, however, that these same "drives" revealed that many small communities are unexpectedly rich in leadership.



A community having rural leadership. Rural leadership means better homes and better folks.

That this number of rural people should migrate to the cities is not of itself cause for regret. Country people multiply more rapidly and last longer than city people, and the increasing use of improved machinery and labor saving implements makes it possible for fewer people to operate the farms and do the work required in rural communities.

But the fact that in the main the most industrious, the most aspiring, and the most capable of our rural young people are migrating to the city makes this matter a challenging problem, and the call of the country for leaders an increasingly important call.

There are rural and village communities in Indiana with no effective, forward looking resident leaders. The vari-

The old and authoritative statement that, "To them that hath shall be given, and to them that hath not shall be taken away" seems to have a peculiar application to the matter of community leadership. A community with strong, productive leaders will not only raise up new leaders of equal or superior strength, but will also attract such persons from other communities.

How often are we reminded that thoughtful and far-seeing parents who find it desirable or necessary to move prefer those communities having "advantages" for themselves and their children. What are these advantages but good roads, good schools, good churches, good markets, etc.? And needless to say these things don't just happen. They are the

fruits of wise and active local leadership. A community with weak, unprogressive leadership will neither attract strong leaders from without nor produce them from within. Like begets like. Birds of a feather will flock together.

When a community is once without forward looking leadership, about the only way it can get it is for some teacher, minister, county agent, home demonstrator, or other trained person to go into that community and with the spirit of a missionary—but not with any holier than thou attitude—and tactfully lead as many as will respond to bigger and better things. It goes without saying that it is only the part of wisdom for such workers to give special attention to the children and young people. I look upon the boys' and girls' club movement and the junior achievement enterprises as among the wisest and most fruitful agencies at work trying to strengthen and redirect rural life.

But whatever the agency adequate rural leadership can only be maintained or produced by the actual presence in each community of persons of ability, industry and unselfishness. Absent treatment will not suffice. Monthly or bi-weekly visits from city-minded ministers, lecturers, or welfare workers are enter-

taining and encouraging, but altogether inadequate.

Graduates of our colleges and universities who by temperament and training are ruralistic can pursue no course more challenging, agreeable and rewarding than to settle in some rural community as farmer, teacher, minister, or homemaker. It may not be the best place to acquire a fortune, or to get one's name on the front page of our great dailies, but for pure enjoyment and worth-while achievement there is none better for the average rural-born-and-reared young person. I use these last words advisedly. For there are surprisingly few city-born-and-reared persons who can go to the country and make good.

It is always disappointing to me to have so many of our own agricultural and science seniors at this time of the year casting about for city jobs. I realize, of course, that many of these will naturally and happily find their way to the country after a brief city experience, but so luring are the fields and farmsteads, and so promising are these times to trained agriculturists and rural leaders that I dislike to see even a brief period of time lost through indecision or preventable delay.

Why Grow Pure Bred Livestock for Market?

By H. R. Hofford, '21

GROWING pure bred livestock for market purposes is a comparatively new phase of agriculture. Although it is new, the practice has met with favor among all progressive breeders and feeders. There are many farmers, however, who fail to grasp the advantages to be derived, or if they do, merely give passive attention and continue in their same rut.

The livestock market has undergone a great change during the past few years. The demand is now for early maturing animals of superior quality and conformation. This raising of requirements necessitated in developing a type superior to the ordinary scrub or grade and also decidedly increased the requirements of pure bred stock. These requirements will

become more and more exacting as time continues. The supply of pure bred is limited and there is an urgent need for stimulating larger production.

The breeding of pure bred and registered stock is a practical business and extends great opportunities to the careful and ambitious breeder. No one advocates that the scrub is better than the grade. The argument in favor of the grade is a justification of the pure bred, as it is the blood of the pure bred that makes the grade better than the scrub. The pure bred is one step ahead of the grade, just as the grade is one step ahead of the scrub. To raise a pure bred animal and keep it in good healthy breeding condition costs no more than to raise a scrub; in fact, the same amount of feed

will produce more meat on a pure bred than on the scrub, and the produce of that animal will be much more valuable. Breeders who maintain show herds and keep their stock in high flesh must necessarily be at more expense than those who do not patronize fairs, but to keep a herd of pure bred cattle in good healthy condition should cost very little more for maintenance than a herd of grades. Many farmers think pure bred too expensive to raise in comparison to the cost of raising poorly-fed grades, but of whatever breed or breeding they should be given sufficient feed for rapid growth because it is a waste of feed and capital if one does not take advantage of their early maturity and aptitude to fatten.

In considering the question of growing pure bred livestock for the market, each class of livestock presents different problems. The kind of market that is being catered to will also figure in the production. Without exception the growing of pure bred will be the more profitable than growing grades or scrubs if the practice is followed for several years. If a farmer is not already in the pure bred business he must use some care as to the way he enters if he desires much success. It is not good practice to stock-up all at once with pure bred, especially if not experienced in the game. Better to start with a few pure bred and the remainder high grades, so that as your stock accumulates the grades can be culled out and only pure bred kept.

Aside from the fact that pure bred are better producers, they make better market stock because they present a uniformity that is desirable on the market. A pen of stock of uniform color, conformation and appearance will bring more money per pound than another pen of uneven stock. They will also find a more ready market because pure bred animals have been produced with the idea in view of making them meet the special market demands.

Even if pure bred stock did not yield larger profits, there is a great amount of satisfaction to be derived by the farmer from the producing and handling of them. The production of high class market cattle makes a good advertisement for

the farmer and opens an opportunity of placing animals for breeding purposes if he so desires.

Pure bred stock is not raised in some communities because the price of a good pure bred sire is often prohibitive for a farmer who does not keep a great number of cows. This should not discourage the farmers in production of good stock for market because the difficulty can easily be overcome by co-operative or community breeding. Several farmers can go together and a community can thus obtain sires of such quality that an individual could not afford. After a few seasons the sire can be sold or replaced by one from a neighboring community. Thus co-operative breeding helps the small breeder and feeder by enabling him to reap the extra profits of pure bred livestock without as much expense.

If good grades are produced for the market instead of pure bred the service of a pure bred sire is necessary anyway. The limit of such production is only a high class grade but if pure bred females of ordinary quality were used the additional cost would be small and the offspring would not only be better suited to market demands but his superior individuals would find a market with breeders at a high figure.

Crossbreds are often produced for the market. It is true that the first cross is often an animal of increased vigor, and quality, but it is not a paying proposition to follow indefinitely because two different kinds of pure bred must be kept and often the cross looks so good that the farmer will be tempted to keep it for breeding purposes. As the cross will not breed true it often results in a depreciation of his market stock.

The same arguments hold good for other classes of livestock,—hogs, and sheep. Through experiments and observations we see that pure bred sheep and hogs almost always net the most profits. It is true with sheep and other classes of livestock that grades and cross-breds often take first prizes and championships but these are often bred solely for that one show and it is a short-sighted policy and lack of business judgment to raise

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The Practice House

By Mary L. Matthews

Head of Department of Home Economics

IN September, 1919, a Practice House became a part of the equipment for Home Economics at the University. The Practice House is a laboratory arranged to afford each student in Home Economics an opportunity for practice in the management of a home. Its purpose is "(1) to more fully establish standards of right living, (2) to afford each student

and "Home Management" because it seems best that a student complete all her foods and cookery, dietetics and laundry courses before going to live in the house. The "family" consists of a group of six students and a chaperon. Each student lives in the house for thirty consecutive days during which time she is to act in six capacities, namely—hostess,



Practice house at Purdue University.

opportunity to measure herself by these standards, (3) to afford the teaching staff means of checking efficiency of training given, (4) to afford a limited amount of vocational experience."

The University rented a nine room house near the campus, and the class in "The House" planned and purchased the furnishings. The approximate cost of the furnishings was \$2,500 and in addition Mrs. Charles B. Stuart gave several hundred dollars' worth of furniture which is being used in the living room. Other gifts such as books, pictures, a suction sweeper, etc., have been received and the house is now well equipped throughout.

Only Seniors in Home Economics are admitted to the courses in "The House"

housekeeper, assistant housekeeper, cook, assistant cook and waitress. Each "duty" is outlined in the following way:

'Duties of Cook:

1. She prepares menus with assistance of the hostess; all menus being approved by the supervisor.
2. She takes full charge of the preparation and service of meals.
3. She does all the buying of food supplies.
4. She turns over all bills to the hostess.
5. She takes care of the refrigerator and pantry and puts away all food; refrigerator to be thoroughly cleaned once in five days.

6. She makes and bakes good yeast bread once during the five days.

7. She takes an invoice of food on hands at close of five days and sells same to next cook; she must make statement of this to the hostess."

Each girl pays ten dollars as the month's rent—this sum being used to pay the house rent, gas and electric bills; in addition each member of the household pays for the actual cost of meals, the household supplies and laundry, divided

3rd day: Breakfast—Corn Flakes with Sliced Bananas, Biscuit and Syrup, Coffee.

Lunch—Spanish Rice, Lettuce with French Dressing, Bread and Butter, Stewed Apricots.

Dinner—Meat Loaf and Tomato Sauce, Delmonico Potatoes, Head Lettuce with Thousand Island Dressing, Hot Rolls and Butter, Ice Cream, Macaroons.

4th day: Breakfast—Oranges, French Toast and Syrup, Coffee.



Lighten the housework with labor saving devices.

pro rata. The cost of meals ranges from 18 to 23 cents per meal. When students have guests they pay 30 cents per meal for each guest. Only mothers and sisters are allowed in the house as "over night" guests.

Meals for This Week.

1st day: Breakfast—Grapefruit, Rolled Oats, Toast, Coffee.

Lunch—Creamed Salmon on Toast, Spiced Grapes, Bread and Butter.

Dinner — Swiss Steak with gravy, Browned Potatoes, Creamed Corn, Lettuce Salad, Apricots, Vanilla Wafers.

2nd day: Breakfast — Oranges, Wheatena, Muffins, Jam, Coffee.

Lunch—Baked Beans, Brown Bread, Baked Apple.

Dinner—Pork Chops with gravy, Glazed Sweet Potatoes, Waldorf Salad, Jello, Wafers.

Lunch—Cream of Tomato Soup, Potato Salad, Bread and Butter.

Dinner—Meat Loaf (left over), Brown Gravy, String Beans, Lettuce and Carrot Salad, Bread (homemade) and Butter, Apricot Jelly with Whipped Cream.

5th day: Breakfast—Cream of Wheat with Dates, Toast, Bacon, Coffee.

Lunch — Spaghetti, Lettuce Salad, Bread and Butter, Jam.

Dinner—Veal Steak with gravy, Baked Potatoes, Perfection Salad, Bread and Butter, Raisin Pudding with Orange Sauce.

A budget of expenses has been made and household accounts are kept; records of time used for work are recorded by each student.

All work is checked by the supervisor each day and in most cases it is not nec-

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Coloring in Butter

By Prof. H. W. Gregory,
Professor in Commercial Dairying.

UNIFORM color is one of the desired qualities of commercial butter. Not only must the butter from the same churning be uniform in color throughout, but the butter should not vary in color in different seasons of the year.

The natural color of milk fat or butterfat from which butter is made varies considerably during the different seasons of the year. Butter that is made in June when cows are on full pasture is of a light, golden yellow color, and in adopting a standard color for butter this color is taken as the ideal color, although there are many markets that demand either a lighter or higher color than this, although seldom higher. In order to have the same standard color all seasons of the year, it is necessary to supplement the natural color with artificial coloring.

The natural coloring matter in butterfat is due to two pigments, carotin and xanthophyll in fat, and these pigments come originally from the feed the cow consumes and is found along with the green pigments in growing plants. It passes from the stomach through the circulation of the cow and into the milk fat in an unchanged condition. This coloring matter has no food value nor does it add any taste to the butterfat. Carotin is found in the largest quantities and it is found in the chromoplasts in various plants, especially in the carrot. Also fresh, green grass is very rich in carotin. Carotin is not transmitted to the milk glands and body cells from the food by means of simple solution in the blood serum, but is carried through the body in combination with an albumen of the serum, and it has been shown that the carotin and xanthophyll pigments of the body fat are derived also from the food of the cow. Xanthophyll, the other colored pigment of butterfat is found in yellow autumn leaves as well as in the body fat of the cow. It is thought that it is probably a decomposition product of chlorophyll. Owing to the instability of

chlorophyll it has never been obtained absolutely pure.

The classification of plant and animal pigments which is at the present time generally accepted is to restrict the names carotin and xanthophyll to the two great classes of yellow plant pigments and to include under the name lutein or lipochrome only those yellow pigments which are considered to be of animal origin. Recent work in animal chromatology shows that lutein can be subdivided into carotin and xanthophyll. The yellow lipochrome of the body fats, corpus luteum, and skin secretion of the cow like the lipochrome of butterfat is composed principally of a pigment whose physical and chemical properties are identical with the carotin of green plants.

The artificial coloring of butter is specified in the law of August 2, 1886. The Pure Food Law which went into effect January 1, 1907, recommended that the different brands of butter color on the market be investigated and reported to the Secretary of Agriculture in order to determine whether or not these artificial colors contained any harmful material.

The brands of butter color on the market may be grouped into two different classes. First, those made from annatto seed by the use of some oil as a solvent, and second, the aniline, or coal tar, or mineral colors. The vegetable, or annatto colors, are not so strong as the aniline color. Aniline colors will fade when exposed to sunlight. Vegetable colors have a peculiar flavor due to the oil used in the manufacture. Vegetable colors are used exclusively in Denmark but aniline colors have been more or less extensively used in this country. Annatto colors are harmless and they give the butter a natural yellow color. Annatto color is a fast color, and will not fade even when exposed to direct sunlight and when properly made should add no flavoring material to the butter. The principal objection to its use is the uncertainty as to its harmlessness.

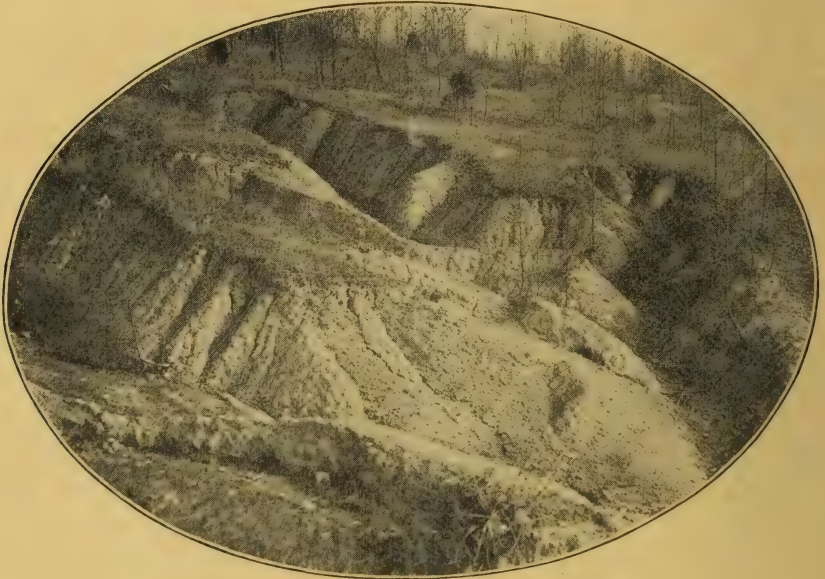
Pasture Management and Weed Control

By E. R. Tam, '20.

IT is a quite universal error to conclude that the poorest land should be devoted to pasture and the best soil reserved for the crops that will, supposedly, make larger returns. This is erroneous, as proven in the "Old Country," especially in Holland, where extremely high priced land, ranging in value from \$800 to \$1,000 per acre, is devoted almost entirely to pasture for

on lime-hungry soil. The Kentucky horse produced on the limestone soils of that state is an example of stamina, hardiness and strength.

Phosphorus is another element usually lacking and should be supplied in the form of basic slag, acid phosphate or bone meal. The nitrogen supply will usually be supplied by the clovers when



Cheap but not profitable grazing land.

dairy cattle. Here in our own country pasture lands are receiving more and more attention and many an acre of Virginia bluegrass is producing more beef or mutton, or horse flesh than the average acre of corn belt land.

The most common causes for poor pastures are, being overstocked, too early grazing in the spring, lack of drainage, lack of soil fertility, and a lack of lime to keep the soil sweet. Lime is the bed rock for good pasture. It not only sweetens the soil and causes the grass to grow much more luxuriously, but directly affects the animals grazed thereon. It is a well known fact that pasture lands rich in lime produce hardier, stronger and healthier animals than those produced

once the soil becomes sweetened by liming.

Overstocking.

Some grasses seem benefited by hard grazing and much tramping. Bluegrass is one of these. It does better on well packed soils. There are other grasses, however, that will not withstand so much grazing and tramping. Timothy is one of these. Mixed pastures usually withstand grazing better than the strait pasture. Two good ones for this locality are:

First, Kentucky Bluegrass 12 to 15 pounds.

Timothy 6 to 8 pounds.

Red clover 8 pounds.

Alsike clover 4 pounds.

Second, Timothy 8 pounds.

Red clover 7 pounds.

Alsike clover 3 pounds.

The pastures should be allowed to obtain a good start in the spring before turning in stock. Namely, for two reasons. The first upthrust of the grass contains but little more than colored water and it takes long days of sun to put any sweetness or strength into it, and second, having been besieged all winter by cold and darkness, it now needs a chance to stretch up into the sunlight and elaborate its sap and strengthen its root system for the season's growth. Allow-

readily over these same spots. Therefore it is best to rotate the different types of animals on a pasture, using first the horse, cattle and the sheep. This is likewise a control measure for weeds, as the different classes of animals have certain preference for weeds.

Weeds are a serious problem in pasture lands, especially when the growth of grass is scant and the sod broken by grazing during wet weather. Since a weed is a plant growing, where it is desired that something else shall grow, it is our purpose to eradicate them.



Shade and luxuriant grass, a paradise for cattle.

ing the pasture to obtain a start aids the grass to provide shade for the soil to retain its moisture, in short to make a soil mulch of the grass itself.

Manuring in the late fall and early spring will nearly double the crop of grass. This covering of manure should be fine and of medium thickness. Nearly all farmers believe that manure put on pastures makes the grass coarse, rank and distasteful to animals. The reverse is true; manure on pastures makes the grass more appetizing and nutritious providing it is a mixture of horse and cattle, or other farm manures. But when a large amount of horse manure, alone, is applied to pastures for horses we may have developed intestinal disease and worms. Horses instinctively shun the grazing near or over their own droppings, while sheep and cattle graze

The most common pasture weeds are the ragweed, ironweed, yarrow, hickoryweed, mullen, ox-eye daisy, wild carrot, wild garlic, Canada thistle, white top, quack grass and horse or "bull" nettle. With a few exceptions they are all perennials, reproducing from roots as well as from seed and mere cutting, therefore, will not always be sufficient to destroy them.

The following methods of control have proven successful in practice:

1. When seeding a pasture use seed free from weeds.
2. Rotate animals in the pasture, 1st horse, 2nd cattle and 3rd sheep. The sheep will keep down the ragweed, white-top and many of the others.
3. When patches of weeds first appear smother them out with a heavy coating

of manure or straw from one to one and one-half feet deep.

4. Mow the pasture 3 to 4 times during the season.

5. Keep the pasture fertile and sweet (limed) in order to produce an abundant sod, thus crowding out the weeds and keeping them from obtaining a foothold.

6. Scattering salt liberally over weed infested patches, especially while the plants are low and in the leaf stage, the stock will nibble them off while trying to get the salt.

7. Change the pasture often enough, unless it is permanent, to prevent the weeds from getting a headway.

8. Remove stock from pasture when soil is wet, thus preventing the sod from being broken.

9. Enclose sheep on the infested patches by means of hurdles, thus making them graze on the weeds.

Certain weeds will require special attention. This is especially true of the horse or "bull" nettle. To destroy this pest the roots must be destroyed either by grubbing them out or by starving them. The starving consists of keeping down all green growth and thus keeping

the leaves from manufacturing plant food. This may be accomplished by means of the hoe or by spraying with a salt solution (3 pounds of salt to 1 gallon of water). Apply as often as the plants send out new shoots.

The Canada thistle may be eradicated by pulling it up and squirting several drops of crude carbolic acid down the hole on the remainder of the root. They should be pulled up when the soil is wet. Large patches may be eradicated by spraying with orchard heating oil. This kills nearly all vegetation. Apply it pure in the form of a fine mist-like spray. Repeat in about two weeks. For whitetop, spray with copper sulphate, iron sulphate or with solutions of common salt.

Where the pasture is badly infested with wild garlic break up the infested land late in the fall, plow deep enough to turn up and expose as many as possible of the bulbs. Leave in this condition during the winter. Reprow in the early spring—not later than the 10th of April—disc and harrow at least twice and plant to some crop permitting of early plowing again in the fall, and repeat the same process the second spring.

Insect Enemies of the Clovers

By G. O. Standley, '20.

LIKE most of the field crops, the clovers suffer from the attacks of many kinds of insects. No part of the plant escapes attack. The roots, stems, leaves, flowers and seed are eaten by a great variety of them. Even clover hay is the special food of a certain worm. The field of any one of the clovers, especially when in bloom, is alive with insects, some of which are beneficial while others are very injurious.

The Clover Root Borer.

(*Hylastinus Obscurus* Marsham).

The adult, a small, dark-brown, hard-bodied beetle, about one-eighth of an inch long. The larva a dirty white, footless, maggot-like worm about one-eighth of an inch long, yellow head, brown jaws, and is found within the main roots of the plant. The pupa, smaller than the larva,

is also a dirty-white. The egg is elliptical, white, and minute, yet large enough to be seen with the unaided eye.

History and Distribution.

This insect is a native of Europe, where it has been known more than a century. In 1878 it became destructive in New York, but probably occurred in the United States long before that date. It is now distributed from the Atlantic to the Mississippi valley states, and since it is working rapidly westward it will probably not be many years before it becomes a serious pest wherever the clovers are grown.

Life History.

There is certainly but one generation annually, though this appears to be long drawn-out and scattering, individual larvae and pupae may be found throughout

every month of the year. As a rule, however, the insects pass the winter in the adult stage within the roots where they develop. During May they abandon the old roots and seek out fresh plants or fields in which to lay their eggs. The female gouges out a shallow cavity, more often in the crown of the plant, sometimes at the sides of the root, even two or three inches below the crown and in this places, singly, but not far apart, about half a dozen pale, whitish, elliptical, very minute eggs. These hatch in about a week and the larvae, for a time, feed in the excavation made by the mother, but soon burrow downward into the root and before the first of August the majority of them have become fully grown and passed the pupa stage. By October nearly all have become fully developed beetles, but make no attempt to leave the plant until the following spring.

Usually the insect does not attack clover the first year on account of the roots being too small to furnish sufficient accommodations. Infested plants die sooner or later, the time depending upon the weather conditions.

Methods of Control.

The only reliable measure to be suggested is to plow up the field as soon as the first crop is removed. This plowing must not be delayed, for the larvae will then have passed into the pupae stage, and plowing will not injure them to any extent.

Clover Leaf Weevil.

The adult is a stout, oval, hard-bodied beetle, about one-third inch long, with a long, thick snout; brownish color, with several narrow gray lines above and broad gray stripes on each side; twenty rows of small deep punctures on the wing covers. The larvae are footless, at first yellowish-green but become deeper green as they grow older, head brown; feed at night upon the leaves, eating out irregular patches from the edges of the leaves; hardly noticeable in the day, when they lie protected around the base of the plant lying curled up, head to tail.

History and Distribution.

This insect, a native of Europe, first made its appearance in Western New

York in 1881. Since then it has spread eastward and southward until it is now distributed in many of the states east of the Rocky Mountains.

Life History.

The larvae, which hatch from eggs that are laid in the early winter on the stems near the base of the plants, feed on the leaves and become partially grown before winter, when they hibernate in rubbish or just beneath the soil. They come out in the spring and continue to feed on the leaves until about June. When full grown they go just under the surface of the soil and make an earthen cell in which they pupate. They remain in the pupal stage about three weeks. In July the beetles emerge, and for several weeks feed on the leaves, doing equally as much damage as the larvae. By early fall the females are ready to lay their eggs.

Control

Infestations of this insect have almost always been suppressed by a fungus disease and thus repeated injury has been so rare that no means of artificial control has been necessary. When affected by this disease the larvae climb to the top of the plant, curl tightly around the top of a leaf and soon die.

Lesser Clover Leaf Weevil.

The adult is green, snout black, polished and cylindrical, head brown, legs brown. Egg ovoid, pale greenish at first but dark as incubation advances. Length about six m. m., in width about .35 m. m. and larva newly hatched 1.25 m. m. Color white with pinkish tinge, best seen on ventral surface. In a short time the pinkish tinge disappears and head turns black. The full grown larva is a greenish straw color, head light brown. The pupa distinctly resembles the adult. The abdomen is almost colorless with a slight tinge of yellow. The head, thorax, and appendages increasing in density of black from time of pupation until emergence.

History and Distribution.

This insect is common in Europe, being found from Scandinavia southward into Egypt and Asia Minor. Just when
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Haymaking

By S. B. Pershing, '21.

WHAT thoughts are brought to our minds by the mention of hay-making time? To some it will bring thoughts of overwork, drudgery and worry, while to others it will bring the memory of the satisfaction that comes with work on a well managed, yet difficult task.

The failure to enjoy this very essential season of farm work is often due to inadequate machinery and poor supervision of the work. The machinery should all be in perfect working order and system should be used in the work, in order that it may be accomplished in the shortest time possible. Loss of time causes a loss of quantity and quality of hay; it will make the labor problem more severe; and may extend the haymaking season into unfavorable weather, which will cause still greater loss of time and also over-ripe hay. This brings up the problem of when to cut hay for the best feeding value.

"Choice" market timothy must be cut during the first bloom but for feed on the farm, it is generally cut after the first bloom but before the seeds have passed the dough stage.

The first crop of alfalfa should be cut when the little sprouts which grow to produce the next crop, are about one-quarter to three quarters inch long. If they become long enough so that the sickle cuts the tops off, the second crop will be delayed two or three weeks. The sprouts will be found growing from the crown about the time the plant is in the advanced bud stage. The last cutting of the season should be made not later than the first of September, for alfalfa requires considerable growth for winter protection.

Red clover should be cut when in full bloom or a trifle past. It decreases in nutritive value after the heads begin to turn brown.

There are three sizes of mowers in common use. The five foot cut is suitable for use on very rough land but as its capacity is only about nine acres per day, the seven or eight foot sizes are far

more desirable for use on most farms. The seven foot size has a capacity of about thirteen acres, and the eight foot a capacity of fifteen acres per day.

Opinion regarding mowing practice differs. Some mow only in the afternoon and others at any time. No loss of quality will result from mowing while dew is on providing the surface soil is dry and the yield is not extra heavy. With this practice the tedder should follow as soon as the top has dried off.

The greatest problem of haymaking lies in being able to retain the quality of the hay through curing. "Sun kills the hay but wind lets it breathe itself to death." While the plant is living there is a continual movement of water upward through the stem to the leaves where it passes off by evaporation. This will continue after cutting if the leaves are not exposed to the sun until they are crisp, and the plant will dry out without loss of nutriment. If the leaves become brittle before the moisture is out of the stem, curing will be much slower, for it must take place by direct evaporation from the surface of the stem, causing a loss of color and quality.

There are various kinds of equipment on the market for use in curing hay. It is not practical to invest heavily in equipment which will be used only a few days per year, as on a small farm but if the acreage is large, it is desirable to use machinery as much as possible to do away with hand labor. The increased quality of hay produced by complete equipment may soon pay for the investment. The kind of crop grown will influence the methods and equipment to be used. Legumes are hard to cure, due to their high moisture content and the problem of leaf loss. The first and last cuttings of alfalfa are often made in the damp weather of spring and fall. The leaf loss of grass hay is not great and the cutting is generally in the hot, dry part of the summer, therefore the problem of producing high quality hay is not so great in this case.

The tedder is used to stir the hay in the swath so that the air may circulate through it allowing it to cure evenly. It is very valuable for use on legumes and heavy yields where the top leaves would be parched by the sun before the lower part was properly cured.

It is seldom desirable to cure the hay completely in the swath, but it is raked into the windrow after it has wilted and before the leaves become brittle. Here curing proceeds without the parching ef-

the hay is probably the most desirable method.

The hay may be taken up by hand loading, by the hay loader, by the push-rake and stacker or it may be baled from the windrow in the field.

The first two methods are common where the hay is stored loose in the barn. Hand loading should be practiced only where the acreage is small or the ground is very rough. The hayloader as it is built today, saves time and labor



Hay in the making.

fect of the direct sun. The side delivery rake has several advantages over the common sulky. The greatest advantage is that it does not mat the hay together so closely but leaves it rolled loosely together so that air curing is aided.

A still smaller proportion of the hay is exposed to the sun if it is placed in cocks. If the cocks are properly built they will turn a small amount of rain very well, but if much rain is expected, they should be capped. They should be built up, a fork full at a time into a symmetrical cock, peaked at the top and the sides should be raked down to aid in shedding water. Various means of fastening the hay caps are employed. A wire needle attached to each corner and pushed into

and is very desirable for use on level land. By the use of the loader a crew can put up about thirty per cent more hay than by using hand forks. The hay fork is indispensable for unloading and storing in the barn.

If the hay is to be stacked in the field the pushrake and the stacker can be used in combination to reduce hard labor to a minimum. The pushrake takes the hay from the windrow to the stack and the stacker drops it on the stack so that the only hand labor necessary is that of placing the hay.

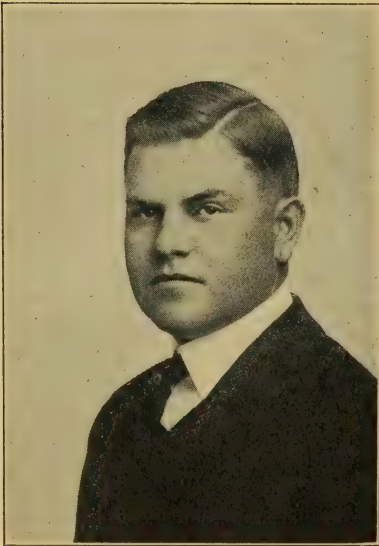
The practice of baling directly from the windrow has been followed with varying degrees of success. The hay must

(Continued on page 482)

Professor O. E. Reed Leaves Purdue

By L. H. Fairchild.

It is with some surprise and a great deal of regret that the people connected with the dairy interests in the state of Indiana receive the announcement that Prof. O. E. Reed, Chief of Dairy Husbandry, is to leave Purdue University. He has been at Purdue only a short time, having come here in August, 1918, but in



Prof. O. E. Reed

that time has made himself well known to the people in this state, not only to those in the dairy business but to those in other lines of agriculture as well. He leaves Purdue to become manager of the Gossard Breeding Estates, which organization has farms at Martinsville, Ind., Preston, Kans., and Axial, Colo.

Professor Reed began his career in the dairy world by milking his way through high school in Moberly, Mo., from which place he went to the University of Missouri. While at the latter school he was closely connected with the dairy herd and after finishing his course in Dairy Husbandry there in 1908, accepted a position as Assistant in Milk Production and was in charge of the dairy herd, which at that time was probably the best university dairy herd in the country. In 1909 Professor Reed came to Purdue as

Instructor in Milk Production, but remained here only a year, at the end of which time he went to Kansas State Agricultural College as head of the Department of Dairy Husbandry. What he did for the dairy department in that school as well as for the dairy industry throughout that state placed him among the big men in the dairy world. An especial part of his work in Kansas that seems to fit him particularly well for his new position was his development of the Ayrshire breed in the college herd and the interest he created throughout the state in that breed because of the remarkable records made by the Ayrshires in the college herd.

In the summer of 1918, after an absence of nearly ten years, Professor Reed returned to Purdue as Chief of Dairy Husbandry. As a result of his efforts in the short time he has been here the department has made some very large strides and a number of improvements and additions have been made during that time. He made such arrangements that the dairy department now has a farm of its own on which to conduct experimental work, pasture young stock, and raise feed for the university herd. A number of animals of the Guernsey breed have been added to the herd, which breed has never been represented in the herd before. A large addition to the dairy barn was made this year, as the increase in the size of the herd made more barn room necessary. Growing out of his interest in the students of the dairy department, student judging teams represented Purdue at the National Dairy Show this year for the first time and made a splendid showing.

The Gossard Breeding Estates are well known for their operations in the breeding of Ayrshires, Berkshires, and Percherons. The Ayrshire herd of these estates is probably the largest in the world. It would be hard to find a man who would be better fitted to take charge of this work than Professor Reed, and these people are to be complimented on securing such a man.

Professor Reed is one of the best informed men in his profession, but his greatest asset is that he has a world of enthusiasm and it is a regrettable situation that such a man cannot be retained

to continue the good work he has done as Chief of Dairy Husbandry at Purdue. It is with wishes for the very best of fortune that we see him start in his new work.

Pasteurization of Milk and Cream

By H. H. Croy, '21.

IT is of great importance that all milk and cream should be pasteurized, thus insuring safety for human consumption as well as improving the quality of the products made therefrom. Pasteurization is the process of heating milk or cream in order to kill bacteria, drive out bad odors and give the milk or cream a better flavor. The effect of pasteurization is to prevent the further growth of bacteria in milk and cream, and secure a more uniform product with better keeping quality as well as a product which is safe for human consumption.

Milk.

Milk is generally collected by wagon or truck on routes laid out by the creamery. By this method one has little control over the source of supply and is not assured of a clean product. The handling of the milk by so many persons greatly increases the chances for infection.

The methods of gathering the milk make it more than ever necessary that it be pasteurized. The greater the danger of infection the more important it is that the milk should be pasteurized.

Milk is usually pasteurized by the continuous method as it permits the handling of a large volume in a comparatively short time. By this method the milk is heated to between 150 to 180 degrees Fahrenheit. It is then passed out of the pasteurizer over a cooler, standardized, and bottled.

Cream For Buttermaking.

Cream for a large creamery is generally secured by stations, located in trading centers and the cream is gathered and later shipped to the creamery.

Cream for butter making should be pasteurized, in order to secure a uniform and better quality product. Pasteurization destroys odors and bacteria, making it

possible for the acidity to be regulated by the butter maker through the addition of Lactic Acid Bacteria, thus securing a better flavor. Also by the use of these "bacteria" a product of better keeping quality is secured.

Cream is generally pasteurized by the "vat" or "batch" method. The cream is placed in vats, stirred, heated by a coil to about 150 degrees for about 30 minutes, cooled to 50 degrees and then churned.

Ice Cream.

The ingredients in ice cream consist of about 85 per cent milk and cream and the balance of sugar or syrup, flavoring extract and gelatin. There are chances of infection in both sugar, flavoring extract and gelatin, and since pasteurization always improves milk and cream it would also improve the entire "mix" for ice cream.

It is advisable to pasteurize the mix in order to kill any bacteria present, and to secure a more uniform and better product. Many factories use some type of homogenizing machine which secures a product of uniform swell by breaking up the fat globules in the milk.

Five Holstein breeders in Adams county are ready to form a Holstein Breeders' Association, is the report of County Agent Fred W. Gray. Some of these men already have their cows on test and the remainder will start testing soon.

The Farmers' Association of Knox county voiced its support of the five-acre corn contest in a recent meeting and plans are being made for the various directors to take the plans up in their local associations and secure a large membership for the coming year.

Preparation of the Seed-Bed for Corn

By W. I. Poe, '21.

As it is drawing near the season of the year for planting, it may be interesting to note a few of the things that will help make corn planting easier and produce a better crop.

Where it is possible the most of our tough, heavy sod should be broken in the fall. This removes the heavy pull from the teams in the spring when weak and helps control many of the insects, and puts the soil in better physical condition.

If the ground has been broken in the fall, the first work to be done in the spring is to drag it as level as possible, and let lay until ready to prepare the seed-bed.

The ground broken in the spring should be kept dragged down to prevent the loss of moisture and to aid in mellowing the soil. If the sun is hot and dry it should be dragged down before dinner, if not early of a morning is a good time.

The next step in preparing the seed-bed is to loosen up the soil, making it mellow but firm. The best and quickest way to do this is to set the tandem disc well down and follow with the spike tooth harrow and a light drag.

The farmers with tractors will be able to accomplish this in two operations by either hitching the harrow and drag together or the disc and harrow. The former is the better arrangement. The way to solve our labor problem on the large or small farm is to hitch several horses together and let one man handle them. Some of the places for such "doubling up" are noted below. In case a tractor is not in use, hitch five or six horses to the harrow and drag combined and you can easily keep out of the way of the planter.

Many farmers use four horses on their tandem, and I have seen four big horses hitched to a single disc. The first is a waste of horse flesh, as the tandem pulls very heavy and only a few drivers are able to keep ahead of the planter. The latter is a loss of time and money in two ways. First, to cover the same amount

of ground you need two drivers and eight horses. Second, your ground is not in as good condition as when cut once with a tandem. By putting on five, or better, six, good horses as shown in the picture you reduce the expense of one man and disc and you have no trouble in cutting twelve to fourteen acres a day. Unless the ground is in very bad condition the three, tandem disc, harrow and drag, will prepare the seed-bed for planting. However, if you have a culti-packer and the time, it will pay to use it after the disc. Of course spots in the field may have to be turned back on with one or more of the implements to get it in shape.

In some parts of Indiana the harrow and drag will have to be reversed as the ground packs after the drag. Through the central part the former way works very good and leaves the ground in fine shape for planting as the marker is easily seen.

There are different ways of putting the corn into the ground; some prefer furrow openers, while others use the cutters. Either way is good. Both have their advantages and disadvantages. The first way makes it harder to plow little corn but gives a better chance to cover the weeds.

Corn should not be planted too deep in the cold ground. One to one and a half inches is good except in light, chaffy ground, where it should be deeper. Three feet four inches is the best width for the rows as few cultivators will cut the centers out if wider. Drilled corn should be 15 inches to 17 inches apart, and checked corn three grains to a hill or an average of two and a half for the field.

After planting, the corn should be rolled or culti-packed and harrowed before coming up. This can also be done by one man by tying the harrow on behind and putting on four horses.

If you have never tried rolling and harrowing try it once and leave two rows once in a while to see if it pays. By working the corn before coming up, you get the upper hand of the weeds.

Problems of the Farm and School

By J. R. Stubbs, '20.

JUST now there is a great deal of agitation as to the wages of all classes of school teachers.

The statistics show that the average daily wage for high school teachers in Indiana is \$4.35; the average for elementary teachers, \$3.31; and for rural district teachers, \$2.93. As there are five school days in each week the weekly salary of the teachers, respectively, would be, \$21.75, \$16.55 and \$14.65. As the school weeks range from 24 to 36 weeks of the 52, you can easily figure what the total salary of the teacher would be, according to the class of teaching he is doing.

A little thought should be given to the preparation that must be made for filling the position in the district or high school. This preparation should include a four-year high school course and an additional professional training in some normal school, college or university. We see that it costs not a small amount of work and capital to prepare a young man or woman for the teaching profession.

More boys and young men today are doubting the value of education than ever before. Boys who stop school while still in the grades are now engaged laborers in industries which pay \$6.00 to \$8.00 and even \$10.00 for eight hours of work. The young men who stayed in school and are now advanced in high school or college and are spending their hard earned money or that of their parents, are becoming discouraged and indifferent in their school work. There have been more failures and low grades as a result of the first semester of college work this year than ever before in the history of higher education. The cream of the faculty staffs is gradually being lost to the cause of education because of the greater financial rewards in commercial work. All such conditions blend into a very strong reason on the part of many young men to discontinue their schooling and take up a trade.

The tendency has always been to use the rural school more or less as a training school for teachers. That this con-

dition is not purely local is shown by a quotation from W. C. Bagley, editor of *Home and School Education*. He says: "Where we now place our transient, immature and untrained teachers in the isolated rural schools, we must come to reserve these schools for the best teachers who have already served apprenticeship under close supervision, who have made an extended preparation for the complex educational and social responsibilities which rural school service always involves, who have demonstrated their ability to stand alone, and who have shown clearly that they have initiative to undertake difficult tasks."

New methods are continually being learned and school teachers cannot keep in touch with new ideas except through an occasional attendance at some training school. Many other problems arise to the needs of education. In the first place, the salary of a rural teacher must be equal to that of a city teacher. While the rural schools have been much hampered the last two or three years by the lack of teachers, and good teachers, the same as city schools, yet the agitation for better pay has been almost wholly from city business men's organizations and city club women. The farmer seems to have trusted his representatives, the County Board of Education, to cope with the situation in any way which they saw fit. The farmer is naturally slow about taking hold of educational matters and is unusually slow on this question of better pay for the experienced rural teachers, and it must be such as will compete with the salaries offered to the city teachers.

Farmers are facing this big problem of retaining experienced teachers in their schools and at the same time having teachers who are abreast of the times in matters of school work. In the solving of the problem then, comes the question of pay, board and janitor work. The pay problem is being solved, but, as stated before, the farmer is letting the city man take the lead and the result is apt to be that the rural school will be left

(Continued on page 486)

THE PURDUE AGRICULTURIST

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

SUMMER EMPLOYMENT.

As the college year draws to a close and the agricultural rush season approaches, both the student and the farmer face a big problem. To the former the question of summer employment becomes more and more important. What should he do? There are the usual offers of lucrative returns for selling sets of useless books to people who don't want them, for driving chautauqua tent stakes and kindred occupations to tempt the undergraduate. A vacation of pleasure and frivolity appeals to some. But what is the purpose of summer employment? Is money or pleasure the goal? Rather should the purpose be to supplement college class room with practical experience, thus preparing for the abrupt plunge into the world after graduation. Three months' service under an expert in the line to be followed as a life work would prove invaluable. The future should not be forgotten in thoughts of the present. Many such opportunities are at hand and should not be turned lightly aside.

From the farmer's standpoint the question has a different aspect. His problem is to gain sufficient help to properly carry on his business. Never was farm labor so scarce. The farmer might well take advantage of the opportunity to engage college men who are free for the

summer. These students realize the importance of practical experience and will prove ready and eager employees. At the same time a breath of freshness and light from the university and experiment station would prove valuable for the actual farmer. The practical agriculturist might well look to the college student for his extra summer labor supply, for these two classes can be mutually helpful, and production increased as a result.

FARM LABOR EFFICIENCY.

The farmers of Indiana have never faced a greater shortage of available farm help than at the present. As a result, wages are soaring and every farmer is confronted with the problem of getting as much work done with as little help as possible. This highly desirable result is obtained only by more efficient management of the farm labor.

The easiest way to increase the efficiency of the labor is to increase the number of horses driven by each man. The old method of plowing with one or two horses did not conserve human labor properly. The present tendency is to use bigger machinery and more horses per man. This is evidenced by the widespread interest in multiple hitches which are devices for hitching several horses (six, eight and even ten) to one implement.

Another means of increasing efficiency is to keep the machinery in first-class repair. This reduces to a minimum the time spent in repairing preventable breaks. It is no uncommon occurrence on many farms for a man to waste much valuable time repairing a breakdown that could have been easily prevented by the proverbial "stitch in time."

Efficiency will also result from the consistent use of a definite and comprehensive but flexible plan of work. Too few men have such a plan and consequently their work is not properly coordinated, resulting in loss of time and waste of energy. The work should be planned in detail for some time ahead; a definite amount of work to be done within a specified time should be set up as a goal to work toward; and a list of rainy day chores should be kept so that inclement weather will not result in idleness or even delay.

These are a few of the ways whereby one may increase the efficiency of his labor and avoid "getting behind" with the work during the spring rush.

MILK PAILS

Did it ever occur to you that during the milking by hand, of an apparently clean cow, approximately 14,000 bacteria fall into a milk pail ten inches in diameter? Experiments here at Purdue have shown this very thing to be true. In the light of this information, it behooves the farmer to consider what sort of a pail he will use for milking, if he wishes to produce a pure wholesome product for the market.

Three things must enter into this consideration of a milking pail—sanitation, stability and simplicity. There are almost as many different pails on the market as bacteria that get into the milk, and each of these are widely advertised with their respective advantages. Of these try to pick one that is practically free from joints, as they are always liable to become a source of leakage. Also avoid the flared top, open pails as they collect dirt too easily. And last but not least, have a pail that can be easily and thoroughly cleaned after each using.

THE LAST

With this issue of the *Agriculturist*, the 1919-1920 staff has printed its last number. There is a certain feeling of satisfaction of a work well done, among those who were directly responsible for this volume and at the same time of gratitude—gratitude to those who from time to time so freely contributed to our pages, and to those who have given us support in various ways.

We wish for the incoming staff the continued support and co-operation of the student body and of the public. Let them make us ashamed of our efforts, by the success of the next year's publication.

FEED CORN OR SEED CORN?

Just a word about the seed corn situation this spring. Too many assume that crib corn this spring will be all right for planting. It is probably true that a large percentage of the corn will germinate well this spring but nevertheless there are conditions which might have affected the germinating quality of the corn last year. Storing in bins before quite dry so as to bring about a heated condition or prevent drying out before the winter freezes, frost in the fields last fall before the corn was thoroughly dry, rain running through the roof and wetting the corn, these and many other factors may have entered in to affect the germination of your corn.

Many are testing every ear again this year. All should run at least a preliminary test. When the weather gets warm enough the rag doll can be dispensed with. Take three or four kernels each from 50 to 75 ears, put them in a nice warm piece of soil in the garden and test in this manner. The experiences of the past have taught us a lesson that seed-corn is an uncertain proposition in Indiana and it is now agreed that a great many poor stands of the past, which have been blamed on bad weather, had really been due to poor seed. Eliminate the guess and gamble by running a preliminary test.

A fair test makes fair yields. Be sure that the seed is well tested before planting.

Alumni and Local

1920 GALA WEEK

Not all the readers of the Agriculturist are Purdue Alumni, but we feel sure that although they are not, they will be more or less interested in the big Gala Week which is to be held here June 5 to 9 inclusive. Last year showed what could be done, to bring the Alumni and undergraduates together and this year it is hoped that Gala Week will mean even much more.

The Alumni Association and the Student Gala Week committee have been working for weeks on what they hope to be the greatest reunion ever held at Purdue. A tentative program has been worked out and we take this opportunity of printing it in hopes that some "long lost Purduan" may read and by reading be prompted to come back for this big play week at Old Purdue.

TENTATIVE PROGRAM FOR GALA WEEK 1920

Saturday, June 5th

8:00 p. m. Smoker for seniors and alumni. At this time members of the 1920 class will be guests of the Alumni Association. A short program of talks by prominent alumni and seniors will be given. Music to be furnished by the Purdue Glee club and Student Orchestra.

At the same hour a separate meeting will be held for women in West LaFayette.

Sunday, June 6th

Automobile trips and visiting.

3:00 p. m. Baccalaureate Address in Fowler Hall.

Monday, June 7th

Morning. Class reunions.

2:45 p. m. Baseball game, Indiana vs. Purdue, Stuart Field.

After the game an informal reception will be held in the Armory. Music; the Military Department will offer an exhibit of its work and equipment for the entertainment of the guests.

5:30 p. m. First annual Alumni-Senior Banquet in Memorial Gymnasium. The dinner will be followed by a short program of snappy talks by representative alumni. In so far as possible each local association will have a speaker present.

7:30 p. m. Concert on campus by Purdue Military Band.

8:00 p. m. Entertainment in Fowler Hall. Detailed plans will be announced within the next few weeks.

After the entertainment, fraternities and sororities will hold open house in honor of visiting alumni. All Greek letter restrictions will be dropped, and visitors will be urged to call at the club houses scattered throughout West LaFayette.

Tuesday, June 8th

10:00 a. m. Annual meeting of the Alumni Association.

Campus luncheon at noon.

Continued Alumni meeting after lunch. Reunion, etc., after Alumni meeting.

Series of contests, stunts, etc., being planned for Tuesday afternoon, all contests to be participated in by visiting Alumni and will be staged on Stuart Field.

8:00 p. m. Faculty reception and Senior hop.

Wednesday, June 9th

10:00 a. m. Commencement.

Make this YOUR slogan: "I WILL come back for Gala Week this year."

Calendar of Events:

1. May 2, 3, 4, 5, 6 and 7—Purdue Egg Show.

2. May 6—Second Annual Barbecue and Stunt Night.

3. First week in May Club Workers Short Course.

4. May 22—State High School Track Meet.

5. May 29—State College Track Meet.

6. Purdue baseball schedule:

April 13—Wabash at Purdue.

April 21—Notre Dame at Purdue.

April 24—Wisconsin at Purdue.

April 27—Illinois at Illinois.

April 30—Iowa at Purdue.

May 7—Michigan at Michigan.

May 8—Ohio State at Ohio State.

May 14—Ohio State at Purdue.

May 21—Wisconsin at Wisconsin.

May 22—Chicago at Chicago.

May 28—Wabash at Wabash.

June 2—Illinois at Purdue.

June 3—Indiana at Indiana.

June 5—Notre Dame at Notre Dame.

June 7—Indiana at Purdue.

The smack of the hickory stick against the pig-skin is a familiar sound to the ears of the Purdue baseball spectators on Stuart field.

O. K. Ziegler, Ag., '20, won the 135 pound wrestling conference championship for Purdue this year. It takes a good man to do this, and Mr. Ziegler is to be congratulated on his good work, "Ziege" has always been a noted feature on the mat at Purdue, and his achievements have proven his excellence along these lines.

The old customs which have been laid down many years ago at Purdue will still live on. At least the Senior class this year has proven that they are backing the Purdue customs when they voted not to wear the caps and gowns at the commencement exercises.

Big plans are on foot for a bigger Gala Week this year than ever before. The committees are actively formulating plans to get in touch with interested alumni and get them back to the festivities this year. The alumni will be entertained as well as the committee can plan for and big masses of alumni are expected back. Among the plans of the Gala Week committee are stunts for Tuesday afternoon and a Senior Alumni banquet to be held in the Memorial Gymnasium June 7.

How about your business letters? Do you make them complete, logical, concise, forceful, sincere, neat and accurate?

Only 72% of the hens in the average farm flock are worth keeping. How about culling out the other 28%?

L. L. Bruner, '11, is manager of J. H. Hook's Dairy Farm at Warthen, Ga.

H. B. Potter, '10, formerly editor in chief of the Exponent and also the Purdue Agriculturist, is now editor of his own paper at Marshall, Ill.

C. C. Wisner, '15, is now assistant director of Agriculture in Ujjain Gwalior State, India. He is working under the director of the Presbyterian Foreign Mission Board.

Purdue won fourth in the Big Ten Conference Swimming Meet held March 19th.

AG. NOTES

By G. A. Ross '16

Alumni Secretary

J. H. Anderson, '18, is living on a farm near Noblesville.

J. R. Finn, '16, is located at Atlanta, Ga., where he is associated with Swift & Co. While at the University, Finn was very prominent in undergraduate activities, as he was a member of several varsity teams.

D. D. Ball, '17, is now living in Rushville, where he has recently accepted a position as County Agent. Prior to the time he moved to Rushville, Mr. Ball was located at Washington, Ind.

Ben F. Brandon, '15, has been living at Beltsville, Md., for a number of years. This town is a suburb of Washington, D. C. Brandon is in charge of U. S. Experiment Station which is located near Beltsville.

Henry W. Brockenbrough, '16, is located in New York City.

J. R. Cavanagh, '16, is with the State Board of Agriculture, at Jefferson City, Mo.

C. C. Cotton, '16, is living on a farm near Tipton, Ind. He may be addressed at Tipton, R. R. 3.

B. H. Doddridge, '15, is a county agent with headquarters at Madison, Ind.

C. L. Rowe, '16, has been with Libby, McNeill & Libby, practically all the time since graduation. For the past few years he has been located at Juneau, Wis., where he is in charge of one of the company's plants in that place.

H. W. Crowe, '17, is on a farm near Webster, Ind.

R. A. Innis, '17, is located in Detroit, where he is bacteriologist and chemist in charge of the laboratory of the Detroit Creamery Co.

G. H. Jones, '14, is on a farm near Newcastle, Ind.

C. W. Newton, Jr., '19, may be addressed at Macon, Ga., 51 Arlington Place.

C. C. Shuter, '16, is farming near Aurora, Ind.

F. J. Sutton, '15, may be addressed at 702 W. Taylor St., Kokomo, Ind.

Don White, "Ag" '22, has been elected captain of the Purdue Tossers for the coming season.

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CORN CULTIVATION

By R. O. Cole, '21.

AFTER good seed has been selected, and a good seed bed prepared, the next important operation that makes for a good corn crop is cultivation. In fact it equals, if not exceeds the other operations in importance. There can be only an inferior crop produced when cultivation is neglected. However, in order to be able to cultivate easily and efficiently there must have first been prepared a good seed bed. The best time to destroy weeds (one object of cultivation) is early in the spring before the crop is planted, and when the soil can be freely stirred.

The objects of cultivation are: (1) killing of weeds, (2) conservation of moisture, (3) aeration of the soil. The conservation of moisture has been looked upon as being the most important, but more recent experiments show that cultivation for the killing of weeds is probably even more important. Weeds, if allowed to grow not only use up a great deal of moisture, but also a large amount of plant food.

Moisture is conserved by the formation of a soil mulch which serves as a blanket to hold in the moisture and keep it from escaping into the air. It also causes more water to be taken up by the soil after rains.

Cultivation aerates the soil and thereby increases the production of nitrates, which are so important in plant growth.

If the ground is not too wet and especially if it has become crusted, the first operation after planting should be to give



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the field a general harrowing. This may be done either before or after the corn is up, depending upon the condition of the soil. If a crust has formed it should be done before the corn comes up. Otherwise, it may be done after the corn is up. If the latter practice is followed it should be done during the heat of the day when the leaves are not so brittle. This cultivation will do much towards destroying the small weeds.

The first regular cultivation should begin as soon as the corn is large enough for the rows to be easily followed. The intervals between cultivations must depend upon the condition of the soil and the growth of weeds. However, the crust which usually forms after a rain, should be broken so as to again establish a mulch no matter how soon this may be after the previous cultivation.

The important principles of keeping down weeds and preserving a loose mulch should be kept in mind at all times. Cultivation may profitably continue until tassels begin to show, but it does not pay after tasseling. When the corn becomes too large to be plowed with a two-horse cultivator, a one-horse harrow-tooth or five shovel cultivator may be used. Ordinarily about six cultivations will be found profitable. In an experiment carried on for four years at the Purdue Experiment Station six cultivations, four with the ordinary two-horse cultivator and two with the one-horse cultivator gave the best results. In wet seasons frequent cultivations do not pay.

As to the depth of cultivation it has been proven that under ordinary conditions the first cultivation may be a deep one and each subsequent one shallower until the third cultivation is reached. After this it should be as shallow as possible in order that the roots may not be injured. By deep cultivation we mean anything more than three inches, and a shallow one is anything less than three inches. If weeds are not troublesome and the soil is in good condition, shallow cultivation may be practiced throughout the season. If a good seed bed has been prepared before planting, it seems that the main benefit of cultivation is to be derived from keeping down weeds and preventing the soil from baking.

HEADS ALL HERDS

In Iowa Cow Testing Associations

The Quaker Oats Company,
Chicago, Ill.

McGregor, Iowa,
Jan. 30, 1920

Gentlemen: — I am pleased to state that we have used SCHUMACHER FEED quite extensively in growing and developing our herd.

It is a great aid in promoting heavy production of milk and butter fat. We appreciate it much because of its perfect balance which makes it a safe feed to use in large quantities when feeding for heavy production.

We have fed SCHUMACHER FEED with excellent results to hogs and horses as well as to the Dairy Herd.

Yours very truly,

R. G. KINSLEY.

Note:

{ R. G. Kinsley's Herd has been making the best record in the McGregor Cow Testing Association, which for several months has been leading all Testing Associations in Iowa, having the best ten highest producing cows.

The Schumacher Feeding Plan Will Help the Cows Increase Production

The Schumacher Feeding Plan consists of feeding SCHUMACHER FEED as the carbohydrate part of the ration and BIG "Q" DAIRY FEED as the protein part. These two feeds have proven with dairymen everywhere to be the ideal combination for best health conditions and maximum milk production. They simplify your ration problem—insure greater accuracy and uniformity, and require much less labor.

SCHUMACHER FEED is a finely ground, kiln dried, carbohydrate ration composed of various grain by-products that best supply the necessary maintenance for long time milk production. It affords that much needed variety of grains so essential and necessary to keep your cows in tip-top physical condition—to provide stamina and endurance to withstand the strain of long milking periods.

In addition to being the acknowledged **best** carbohydrate feed for dairy cows, it is also wonderful milk producer. With SCHUMACHER FEED as the maintenance part of the ration and BIG "Q" as the milk producing part, you have a ration that assures maximum production from **any** cow of **any** breed.

SCHUMACHER FEED in addition to being the acknowledged **best** carbohydrate feed for dairy cows, is also splendid for feeding all your farm stock. It puts "pep" and vigor into your horses—makes calves and hogs grow fast and produces big frames. It restores strength and vitality so dry cows assuring maximum milk production during the next lactation period.

Get a supply of SCHUMACHER and BIG "Q" from your dealer—let these feeds do for **you** what they are doing for thousands of other successful dairymen and farmers.

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To properly ripen the cream for butter, and the milk for cheese and commercial buttermilk, use Hansen's Lactic Ferment Culture.

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As has been suggested, shallow cultivation should be practiced to avoid cutting the roots. When these roots are cut off it not only lessens the food supply for the plant but also requires some of its energy to reproduce the destroyed roots. Experiments show that there may be a difference of thirteen bushels per acre shown in favor of no root injury.

Under practically all conditions of rainfall and on most types of soil, level cultivation is most desirable. Ridged cultivation must necessarily be deep and is usually accompanied by an injury to the roots of the plant. In some bottom lands ridging may be necessary in order to control the morning glory or other troublesome weeds. This is especially true when the corn is drilled instead of being checked. The ridging is accomplished by the use of a disk cultivator. The ideal cultivation is not absolutely level, as there should be a slope of from one to three inches between the rows.

Ordinarily, the kind or type of cultivator used is not so very important. The skill with which it is used is of vastly more importance than the kind. The disk and larger shovel types are most serviceable when the weeds become large. However, when the weeds are not too bad the small shovel or spring-tooth types may be more satisfactory. If only one cultivator is to be used, it should be of the four shovel gang or disk type. On reasonably level land, a two-row cultivator can be used to a great advantage and will save a considerable amount of time and labor.

POOR STOCK, LESS FARM INCOME.

It doesn't pay to grow low-grade or scrub stock of any kind. This statement is made by the United States Department of Agriculture in connection with a series of tests on efficiency in farm management in the South. On 289 dairy farms it was found that 48 farms receiving \$50 and less income per cow and labor incomes 45 per cent below the general average. On the other hand, the 28 farms with receipts per cow of more than \$120 had labor incomes 75 per cent above the average and were the most profitable of the group.

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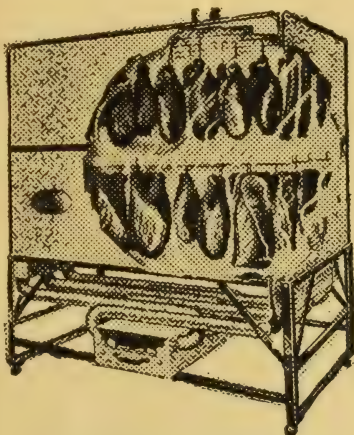
It is compact and can be taken through an ordinary door. Made in all sizes, ranging from two-hog capacity on up.

Can be operated from chimney same as stove and requires very little attention. Smoke goes through an air-cooled radiator before reaching meat, and can not overheat.

Glass doors, to watch operation, absolutely fireproof, complies with all fire insurance laws, saves money and does the work very satisfactorily.

Write today for circular explaining the greatest common sense smoke house built right here in Indiana.

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Sectional View of the Eureka

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The increasing popularity of milk products is largely due to the educational work of the Agricultural College.

The Agricultural College has not only demonstrated the exceptional food value of milk, but has also educated the dairyman in methods of manufacture that insure to the consumer a wholesome, nutritious dairy product entirely free from harmful bacteria and insanitation.

These methods have been assisted and made possible by the aid of



a cleaner which provides the most efficient, sanitary cleanliness to dairy equipment, and for this reason it bears the endorsement of the Agricultural Colleges of the United States and Canada.

Order from your supply house.

It cleans clean.

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in every
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MARKET EGGS: 'CHECKS' AND 'DIRTIES'

By W. B. Werner, '22.

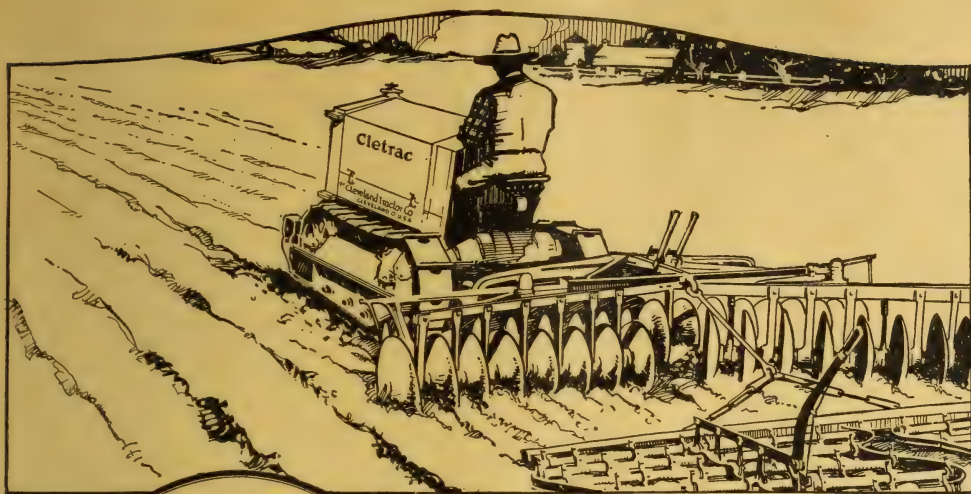
Among all eggs sold on the market there are a certain number of "checks" and "dirties." It was formerly the custom of the commercial egg dealer to cull out these eggs and to dump them in the garbage can when they could not be disposed of at once. In later years a new industry has sprung up by which these cull eggs are utilized and now they are broken out and either frozen or dried.

As is the case with all eggs coming into a storage plant these eggs are candled providing they are not too badly broken, in order to determine if they are fresh. They are then weighed out in fifteen pound lots and placed in buckets ready for the break room. The badly broken eggs are placed in leaker trays and are taken to the break room separately.

The break room is equipped with metallic topped tables and white enameled stools. The tables are made with funnel-shaped holes under which large cans are set to catch the shells. The apparatus for breaking the eggs and separating the whites from the yolks consists of a small bread pan shaped plate, a stationary knife edge, a yolk holder which is fastened by a swinging pivot and four metal cups; one for yolks and three for the whites. The operation of this apparatus is simple to one who has become accustomed to it, but the beginners will have trouble in swinging the yolk holder back and forth without getting egg upon their fingers and clothes.

Two distinct brands of the finished product, besides the frozen whites, are manufactured, one in which sugar is added and the other in which both salt and sugar are added. To do this mixing thoroughly the eggs are put through a churning process. The churns are double walled, brim cooled circular vats having a capacity of about one-hundred and seventy-five pounds and is agitated by means of a revolving spiral.

The churned egg is run out through the sliding spigot in the bottom of the churn and weighed into paraffined cans. These cans when full hold about thirty pounds, but they are not filled entirely



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TANK-TYPE
TRACTOR



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FROM January to January the Cletrac takes on *all* the hard jobs over soft, wet ground or mellow seed-beds. It never sinks in or packs but rides lightly and easily over soft soil and turns practically *all* of its ample power into direct draw-bar pull.

The Cletrac not only plows but does quick, thorough fitting that leaves a clean,

clear seed-bed, gets all crops in on time and insures bigger yields.

This fast, light-footed tractor is putting business-like system into modern farming. May we send you information about the Cletrac? You will be choosing your own tractor soon or will be called on for advice. It is well to have interesting and practical tractor material at hand.

The Cleveland Tractor Co.

"Largest Producers of Tank-Type Tractors in the World"

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Cleveland, Ohio

at one time. In most instances twenty-five pounds is weighed into each can at the first filling and after this has been allowed to freeze and expand the remaining five pounds is added. By filling the cans in two pourings instead of one, the surface bulge is lessened, thus giving the can a better appearance.

Extreme sanitation is practiced about the break room. The girls wear white

aprons and the churn operator and his assistant wear white overalls. The breaking trays and cups are turned into the washing kitchen every half hour to be washed and sterilized. In the evening the entire apparatus of the break room is washed and sterilized and the floor is scrubbed. This extreme cleanliness is necessary in order to keep the break room fresh as well as keep the churned egg free from bad odors.

The churned egg is frozen in refrigerator rooms where a constant temperature of about 9 degrees Fahrenheit is maintained. When the egg has become solid the cans are covered, wrapped and stored for shipment to the markets.



**Our
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Fountain**
is a wonder.
It keeps the
water warm
in winter, **cool**
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Can move
your water
supply to any
part of the
farm.

Write for catalogue today.
J. Q. CLARKE TANK CO.
N. Walnut St., Crawfordsville, Ind.

LINES.

It may be worth while to take a little time and describe how to fix the lines to manage six horses. The six can be easily handled by any of the three ways:

First, put the lines on the middle team and jockey the others off.

Second, put the lines on the outside horses and also on the middle team and tie all the bits together with a light rope. This is a little unhandy at first because of the four lines, but after getting used to them it is the one you will use as you get quicker action from a slight pull.

Third, this method is also used and the one I use for five or less. The lines are put on the outside horses and the bits all tied together with a light rope. After the correct distance is found the rope should have a snap fastened on it for each horse. This makes hitching and unhitching easier and the horses will walk more uniform.

In either of the last two methods a fast horse can be tied back without causing any trouble.

It is not hard to hitch and drive a large team. My eleven-year-old brother handled four to six-horse teams all last spring in our corn crop.

Tramps are fewer and thinner than usual. Can you guess why?

It is a great deal easier to find individuals who can tell you how a thing can not be done than it is to find one who can tell how it can be done.

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SEE OUR WINDOWS

THE HUB

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Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

Acme Dairy Feed

This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

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Office Supply
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Heavily Stocked, is
Operated in
Connection*

WHY GROW PURE BRED LIVESTOCK FOR MARKET?

(Continued from page 454)

this class of stock alone for market when just one step ahead is another that holds forth greater profits, satisfaction and advancement.

THE PRACTICE HOUSE

(Continued from page 456)

essary to criticise the work more than once. The students are many of them very busy with other classes but manage their work in the house so that it does not interfere, nor does it "wear them out." As many labor-saving appliances as possible are used such as a fireless gas stove, a kitchen cabinet, a high stool, a wheel tray and a suction sweeper.

Each hostess must arrange to have guests once during her five day term. There have been dinner parties, buffet suppers and receptions arranged which have been managed successfully.

Many of the colleges and universities throughout the country are maintaining Practice Houses at the present time, and in all cases the work has been most valuable for the student. Her "housekeeping experience" in the Practice House should make it easier for her to establish and manage a home when the opportunity arises, it should make her better able to adjust her standard of living to circumstances and should help develop her into a well-poised and capable woman.

HAYMAKING

(Continued from page 463)

be more thoroughly cured than is necessary when it is to be stacked. Proper conditions for baling depend on several factors, as: heaviness of stand, method of curing, humidity of air, and temperature of the air. A much higher quality of hay will be obtained through the use of the curing truck.

Haymaking is one of the hardest tasks of the season but by the use of equipment and methods suited to the local conditions, it may be made out of the most enjoyable.

The old song "Everybody Works but Father," is now a back number; even father works.

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The Universal Tractor

DOES all field work—including cultivating, harvesting and belt work. One man operates both the tractor and the implement. The operator sits in complete safety in the usual place—on the seat of the implement.

The work is always in plain sight—no looking backward. Tractor and implement form one unit—can back and turn short.

These indispensable features are particularly profitable at harvest time, when one man instead of two can cut the ripe grain at the rate of 40 acres in 10 hours.

The necessity for saving time and labor is the greatest consideration before the farmer today.

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Shorten Your Harvest Days

INSECT ENEMIES OF THE CLOVERS.

(Continued from page 461)

this insect was introduced into America is unknown, but was found as early as 1865. Although it has been found in the central states it has never been abundant inland and is still injurious only throughout the northern and central Atlantic coast region.

Life History.

The adult comes forth from hibernation in the fields as soon as warm weath-

er starts young growth of clover; probably during the last of March in ordinary seasons. The sexes pair, and egg deposition soon commences. The egg period varies from seven and one-half to eight and one-half days. The larva period varies from seventeen to twenty days. The pupa stage occupies about six days. The entire period from egg to adult is about thirty-two days.

While there is but a single generation annually the breeding season is greatly prolonged, egg deposition probably covering upward of six weeks and late in this season all stages may be observed at the same time. While the larva can feed on all parts of the clover plant above the ground, they prefer the tenderest unfolding leaves, in the fields they select these parts and feed among the folds; later they attack the heads; both young and in full bloom. They make cocoons on the leaves of the clover in which to pupate.

Control.

The same is true with this insect as with its larger cousin and the same

Purdue State Bank

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Manufactured in accordance with the Indiana Feeding Stuffs Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining "KINGAN'S" Digester Tankage of your dealer.

KINGAN & CO. LTD.

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to buy en-
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from our

**STOCK
BREEDER'S
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An Experienced Veterinarian who knows stock and how to advertise it,
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**HIGH GRADE MIXED FERTILIZERS
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fungus disease is relied upon to hold it in check.

In view of the fact of many insect pests which work on clover it behooves the farmer to keep a close watch on his clover crop as well as other field crops.

PROBLEMS OF THE FARM AND SCHOOL.

(Continued from page 467)

behind again. Farmers' organizations should pass resolutions calling upon their representatives to solve these problems by appropriate legislation. The big problem of urban people is mainly one of salary, but rural people have these other problems which are equally important. Pay alone will not solve the problem and just now, when so much attention is being focused on the school, is the time for the farmer to act and secure legislation which will mean better rural schools for the next generation of school children as well as the present.

Many young people make mistakes of failing to distinguish between work that requires training and a position where no training is necessary. Many boys and girls when they leave school find work which offers a high wage for a beginner, but these wages seldom grow because the work requires little or no training. A position with a future and steadily increasing wages requires school training, and even though the person may have to stand under a relatively low wage, it will be the most profitable position in the end. It is this position, whether in the city or on the farm that young folks of today should be training themselves to fill. It means that no boy or girl should consider his or her education complete without a high school education and in many a college course. The vocational school is helping to solve many of the problems of rural education.

IVAN S. GLIDEWELL
Spotted Poland Hogs

VERA H. GLIDEWELL
White Rock Chickens

Sunny Brook Stock Farm

PLAINFIELD, INDIANA

Feeding of Texas Bred Hereford Baby
Beeves a Specialty.



A Solid Cutting Foundation

After all, the principal thing is to get the grain cut—all of it. And in order to do this successfully, a binder must have a smooth-working sickle that will not jam or bind, even when the binder is working on rough ground.

McCormick, Deering and Milwaukee Grain Binders cut clean—and continue to do so during the entire life of the machine. There is no twisting, sagging or springing of the cutter bar, because the knife works forth and back on a solid foundation—a Z-shaped steel sill that effectually resists heavy strains imposed by operation in rough, uneven fields. There is no rubbing of sickle sections against guards nor binding due to springing or twisting of the sill, for it does not twist or spring.

This is only one of many features that make McCormick, Deering, and Milwaukee Grain Binders so efficient and dependable—that have won for these harvesting machines a world-wide reputation for economical, satisfactory service.

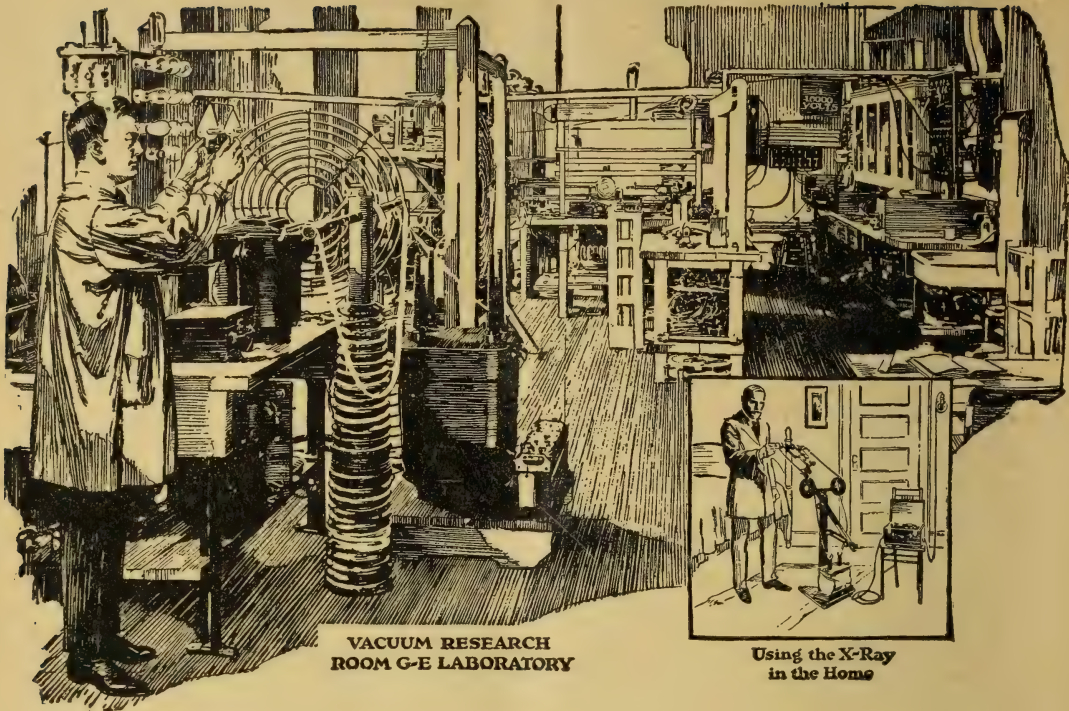
International full-line dealers everywhere handle these standard setting harvesting machines. A post card will bring you descriptive catalog.

INTERNATIONAL HARVESTER COMPANY

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U S A



VACUUM RESEARCH
ROOM G-E LABORATORY

Using the X-Ray
in the Home

Greater X-ray Service— through Research

FOR years after the discovery of X-rays it was evident that only intensive research could unfold their real possibilities.

Meanwhile, scientists of the General Electric Company developed the process of making wrought tungsten. This proved ideal as the target in X-ray tubes and its use for this purpose soon became universal.

Then further research resulted in the development of an X-ray tube of a radically new type—the Coolidge Tube—with both electrodes of wrought tungsten and containing the highest attainable vacuum. But the complication of high vacuum pumps made the new tube in large

quantities impossible. The answer to this problem was the Langmuir Condensation Pump, utilizing mercury vapor in its operation and almost automatic.

To meet the need for simple X-ray apparatus during the war—the G-E Laboratory developed the Self-Rectifying Coolidge Tube, which made possible portable outfits at the front. The latest X-ray outfit of this type is so small it can be taken conveniently to the home or to the bedside in the hospital.

Thus the Research Laboratory of the General Electric Company continues to serve, that progress in things electrical may continue for the good of humanity.

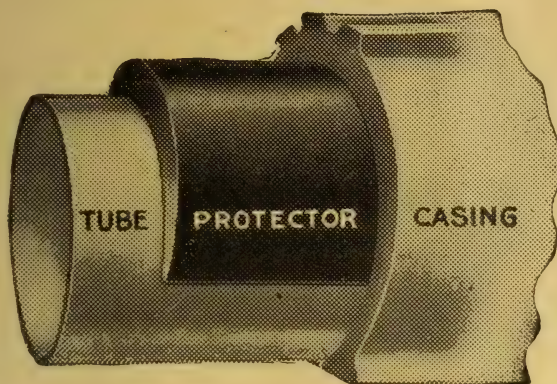


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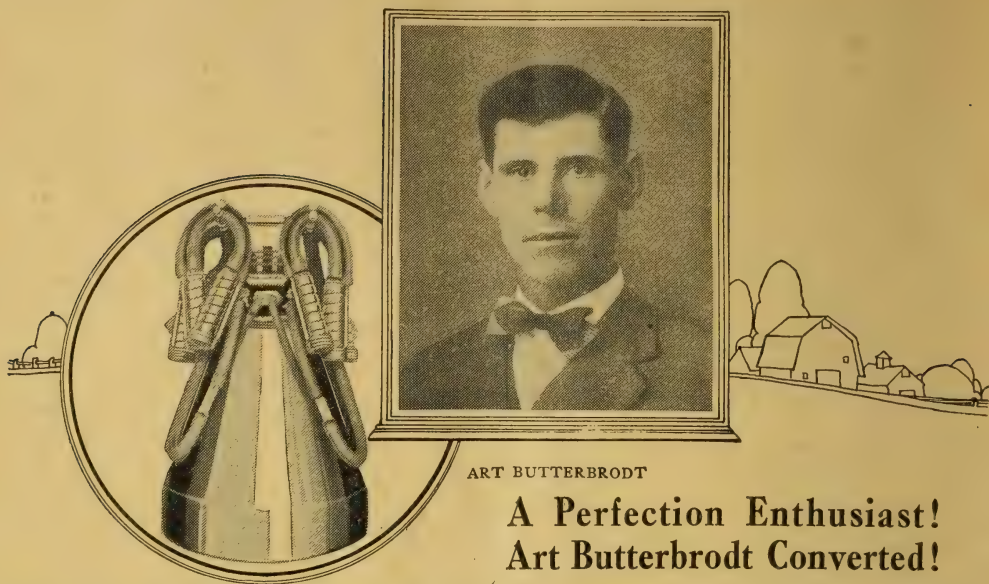
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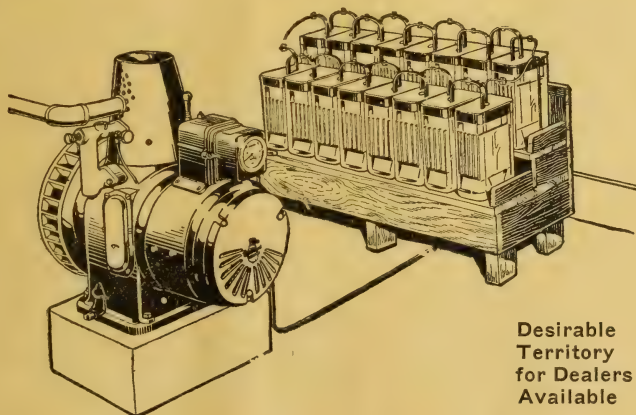


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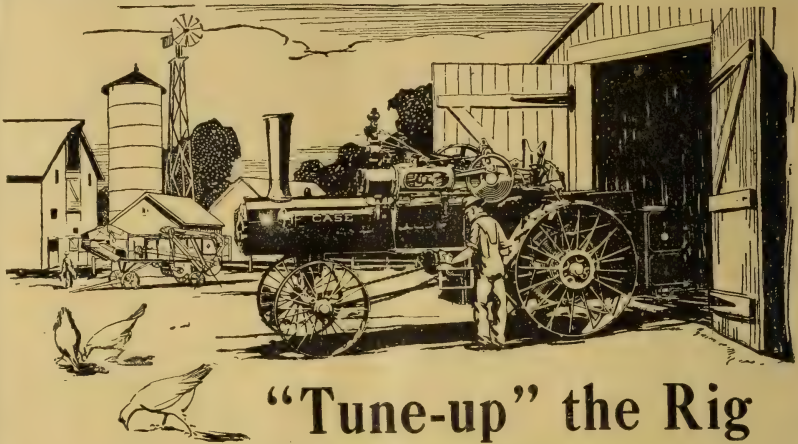
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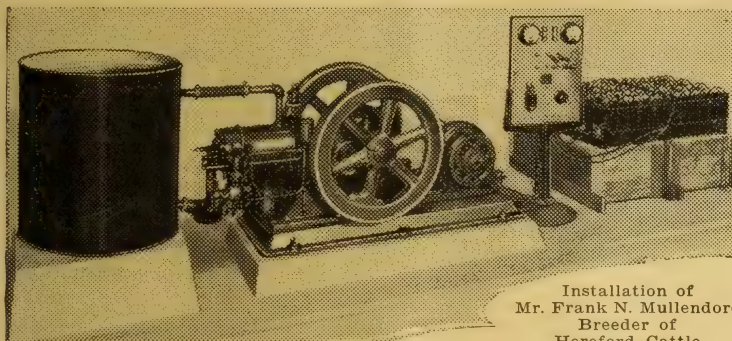
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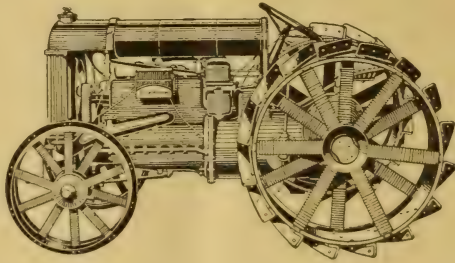
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Vol. 14 No. 9

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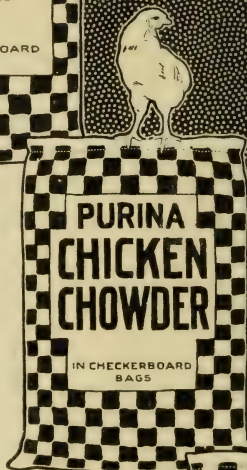
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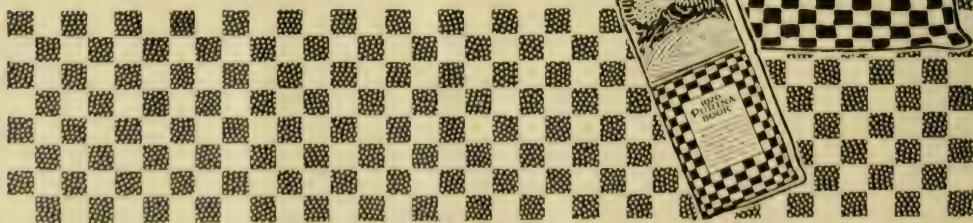


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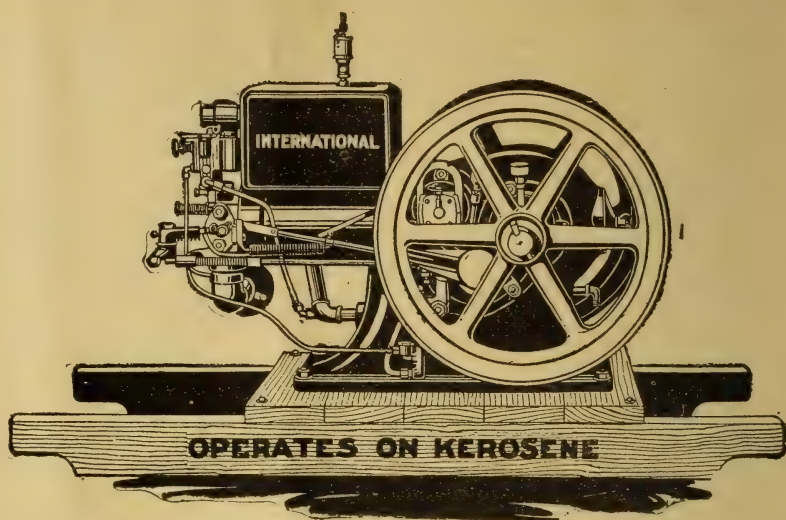
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THE PURDUE AGRICULTURIST

VOLUME XVI

JUNE, 1920

NUMBER 9

Why Clover Failures?

What are we going to do about it?

By G. P. Walker, '16,
Experiment Station Staff.

A RECENT study of the clover situation in Indiana by the Indiana Experiment Station reveals a surprising shortage of this important and valuable crop. Several counties were growing less than one acre of clover for each one hundred acres of other crops while 50 counties showed less than one acre in 16 of other crops. The average of the state for ten years before the war was over 12 acres of other crops for each acre of clover and the same condition prevailed throughout a large part of the cornbelt. This shortage is largely due to clover failures. Most farmers realize that they should have more clover and many are still making seedlings every year in spite of numerous and continued failures. Many farms that 15 years ago were producing fine crops of clover and on which failures were hardly known, will now scarcely grow clover at all. What are the reasons for these numerous failures and what are some of the remedies?

The reasons are many. Lack of lime is probably one of the most common. A large proportion of the cultivated soils of Indiana and other middlewestern states are now acid and becoming more so with each year's cropping. Clover will not thrive under such conditions and it is a waste of time and money to sow it on these soils without first applying some form of lime to correct the acid condition. Some farmers still cling to the old idea that manure is the panacea for all soil ills. On the Worthington Experiment field last year the land which had received an average of two tons manure for every year since 1911 failed to produce any clover from the 1918 seeding while the rest of the field which had been limed seven years before produced a good crop of fine clover hay. The untreated land of this field has scarcely averaged one ton

of hay for the last five years while the limed land without manure or fertilizer has produced an average of 1.7 tons per acre.

Another cause of many failures is the freezing of the young seedlings in the "curl" stage. It sometimes happens that after the seed is sown in February or March a warm spell of several days causes much of it to sprout and a sudden frost kills the tender seedling. However if not seeded till after all danger of frost is over the young plants sometimes succumb to an early summer drouth. Many farmers are now making two seedings, using one-half the seed in February or March and the other half in April. This is a good practice and should be more general. For the later seeding the alfalfa grass seed drill is proving its worth as a small amount of seed may be evenly distributed and the disks make an opening in the soil crust into which the seed settles readily. If the seed is broadcasted at this time harrowing it in is a good practice to prevent its being washed away or bunched by the spring rains. In view of the high price of clover seed, it is a good plan to use a mixture of six pounds clover and three pounds timothy seed per acre. If the clover "goes out" in spots some timothy may be produced instead of a crop of weeds whereas if a good stand of clover is obtained it will easily keep down the light spring seeding of timothy.

Drouths and unfavorable seasons are a further cause of clover failures. When the early settlers came into the middle west they found soils that were well supplied with humus and decaying vegetable matter that enabled them to hold a large reserve supply of water for the hot dry summer season. Under the cropping system that has been followed a large por-

tion of this humus supply has been lost and many of these soils can no longer hold enough moisture for the young clover plants in a season of extreme drouth. The "cure" for the disease is to get more rotting vegetable matter into the soil. One of the temporary remedies that is proving effective in many cases is a light mulching of manure, straw, clover chaff, or other residues on the wheat in winter. This mulch protects the wheat during the late freezing and thawing and often brings the young clover through a summer drouth that would be fatal without the protection which the mulch affords. Many farmers who feed livestock are finding it profitable to apply part of the manure as a light top dressing on wheat in winter for the protection of the wheat and the better chance of securing a good stand of clover.

A lack of phosphorus has also been responsible for many poor stands of clover and some failures. Many soils are needing phosphorus as much as they need lime and both should be applied if good results from clover are to be realized. The rocks from which most of the upland soils have been derived were not rich in phosphorus so that these soils have never had a large supply of it. Constant cropping has so reduced this supply in some of these soils that the amount available for growing crops each year is limited. A liberal application of a good phosphate fertilizer on wheat is often paid for by the effect on the clover following, leaving any increase in wheat yield as clear profit. Last year the limed land on the experiment field near Scottsburg failed to produce any clover while the limed and phosphated land produced a fair crop of clover hay. On the heavy yellow silty loam soil of the Bedford Experiment Field the clover "heaved" much worse last spring where only lime had been used than where phosphate was added. This land is very deficient in phosphorus and the marked decrease in "heaving" was probably due to the greater vigor of the crop when well supplied with the needed element. The use of phosphate fertilizers on this land has increased the average clover hay yield for the last three years almost one-half ton per acre, and the effect on the corn and

wheat crops following has been even more marked as a result of the better crop of clover produced. The use of more phosphate fertilizers will not only increase the yields of grain crops but will help to prevent the waste of clover seed that results from sowing on phosphorus deficient soils.

Much wet land is being put into condition to grow clover through tile drainage. Where drainage is not possible alsike clover is giving good results in many cases where the land is a little too wet for little red. An increasing number of farmers who feed little stock and do not need much hay are using mammoth clover, rolling it down at blossoming time and clipping a seed crop after the tops "elbow up" and the heads ripen. With a fair yield this system furnishes a cash crop and leaves a heavy mat of material already distributed on the land for plowing under. On some of the prairie soils seeding clover with oats seems to be a safer practice than seeding on wheat, though the evidence is not conclusive. When such a practice is followed the amount of oats seed should be cut down to lessen the danger of smothering the young clover. When clover fails soybeans or cowpeas are often used to take its place in the rotation as they will usually give good results on somewhat acid soils or where other conditions are unfavorable for clover.

There are a number of legumes and each one has its special adaptations and uses but for ordinary farm use red clover is the most practical legume crop of the corn belt. It is essential to successful farming and yet clover failures are just as numerous today or more so than ever before. After all they are problems of farm and soil management and will be solved by applying the system that meets each peculiar local situation best. The system of management may well be modified to insure continuous and regular success with clover as that will help to solve other problems. If a mulch or manure will lessen drouth injury they should be applied; if lime or special fertilizer are needed they should be supplied; and if the method of seeding or cropping system are at fault they should be modified.

Farming in the Rio Grande Valley, Texas

By C. H. Wood, '07,
Short Course Student.

ON January 3, 1919, I left my home in Jasper County, Indiana, on a trip to the lower Rio Grande Valley to investigate a farming interest there. It was quite interesting to find the farmers in the valley harvesting onions and cabbage, and a few had their early corn planted. Men were going around in their shirt sleeves and their children were barefooted, while the folks back in Indiana were shoveling snow and thawing out the water pipes. This coun-

ernment records. We have cool sea breezes from the southeast most of the year, so we do not suffer with the heat nearly so much as we did in Indiana, which is hard for the home folks to believe. Of course the sun gets very warm, but with the cool breeze continually a person does not notice the heat. I have not heard of a single sunstroke of man or beast here in the valley. Our winters are very mild also. We had a few light frosts last winter, but they did very little dam-



A residence in McAllen, Texas.

try appealed to me very much and so I purchased a farm, and last winter my wife and I registered at the county seat as residents of Hidalgo County, Texas, so we can vote for Leonard Wood next fall. If you will look on your map you will find a small area of land in the extreme southeastern portion of Texas known as the Rio Grande Valley. It is composed of a narrow strip of land about fifteen miles north and south and about sixty miles east and west. It is the southernmost farming land under Uncle Sam's flag.

Our climate is mild both winter and summer. We have no rainy season, the average rainfall for the past ten years being twenty-six inches according to gov-

ernment records. Because of our warm winters, our hogs and cattle have green pasture all the year round, thereby eliminating winter feeding, the hardest, most unhealthful and least profitable work on the northern farms. We do not need to build barns to winter our stock and very few houses here are plastered. Our doors and windows are open practically every day of the year. The climate has attracted thousands of northern farmers who wish to escape the cold northern winters, and who have made a health resort as well as a farming community of this little valley. Our population is composed of at least 95 per cent. northern people of the better class.

This is an irrigated country, the water

being pumped from the Rio Grande river, thus insuring an abundance of water at all times. The watering system is owned and controlled by the farmers, a share of water stock being conveyed with every acre of land sold. Irrigation means no crop failure, no drouth and no excessive rainfall. It enables the farmers to grow and market some crops every month of the year.

The soil is free from alkali and almost uniform in quality, varying from a rich black silt to a chocolate loam and rang-

The fall crop does not yield as well. Oats are not sown for market purposes, but make excellent winter pasture. Our summer pasture consists of Rhodes Grass, a perennial, which will carry from two to four head of cattle per acre the year round. It also makes an excellent hay.

Alfalfa is the most valuable crop here as it grows very quickly. A neighbor who sowed some last November, has had two cuttings up to May first, while another neighbor, who raises alfalfa exclusively, has made nineteen cuttings in twenty-



A corn field in the lower Rio Grande Valley, May 1, 1920.

ing from twenty to forty feet in depth. The well I had drilled on my farm passed through twenty-four feet of soil. This soil has been deposited by the Rio Grande river in ages past. It is the very cream of soils, with all the elements necessary to produce good crops indefinitely. We never use any fertilizer as a certain amount of silt is deposited at each irrigation. The government compares the fertility of our soil with that of the Nile Valley.

We can raise two crops of corn in twelve months. Our first is planted the last of January or the first of February. Our second is planted the first of September. The spring crop has made as high as one hundred thirty-five bushels per acre, all depending on the care it is given.

four months. I am planning to put out thirty acres this fall. Farmers find it unnecessary to inoculate their seed or soil when sowing, and are always sure of a good stand when put in properly. The hay is retailing at present for forty dollars per ton, and there is a strong demand for it at all times of the year.

This land is also considered the winter truck garden of the United States. We raise vegetables such as cabbage, onions, lettuce and beans. We are eighteen hundred miles nearer the northern markets than are California growers, and also four hundred miles farther south than they, making our seasons about one month earlier. We are therefore the first on the market and can demand the highest prices. Whenever the north has a

shortage in cabbage and onions for cold storage, we Valley farmers have plenty of time to put out a big crop, thereby taking advantage of the high market. One farmer cleared over eight hundred dollars per acre on fifty-four acres of cabbage this spring. His crop was one of the first harvested, and he received as high as one hundred dollars per ton. Fred Schrader, Mrs. Wood's uncle, had the highest yield of cabbage in the Valley, eighteen tons to the acre. Some farmers with late cabbage lost money on account of the car shortage during the railroad strike. Onions are yielding from two to four hundred crates per acre and are selling around two dollars per crate. During the shipping season the railroad ran special refrigerator trains every day.

In a short time this valley will be noted for its citrus orchards, since it is not necessary to fertilize here as in California and Florida. The quality of our grape fruit is recognized as being much superior and very little of our present crop reaches the northern markets. There are a great many citrus groves being set out this spring. Citrus groves are selling for very high prices, ranging from two to four thousand dollars per acre according to age. The government reports show

that California growers use smudge pots to protect from frosts on the average of eight times a year and Florida five times per year, while this valley uses them only once every two years. In my neighborhood, one citrus orchard, set out in 1912, netted an income of one thousand dollars per acre this last year.

Quite a few cattle are raised here, but mostly for dairy purposes. It is also a good country for raising hogs, as the sows can farrow any time of the year.

Our labor situation is good. There are very few negroes in this part of the country and those only in the cities. All farm labor is done by Mexicans, who receive a dollar and a half per day and board themselves. They are acquainted with irrigation, so that a northern man has little trouble in learning to farm here. The Mexican is willing to do any kind of work you ask of him; he will use a hoe in the corn or cotton field all day and seem to like it. This is one place where the farmer is the boss of the hired man. We can get all the labor we want.

As to the Mexican troubles, the northern papers seem to know more about it than we do. We do not in the least feel alarmed over any trouble on this side of

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Purdue Agriculturist Essay Contest

By L. A. Dougherty, '21.

THE first state essay contest for vocational students of agriculture in Indiana, judging from the splendid response given, should be followed by others even more comprehensive and popular than the one now past. The results of the contest clearly show that many students in the vocational high schools are capable of writing very presentable articles on agricultural subjects, articles which are worthy of publication for all to read. Of greater value, however, is the fact that the contest awakens interest in agricultural journalism among the young people who are to be our progressive farmers of the future.

This essay contest was prepared and conducted by the Purdue Agriculturist under the direction of R. V. Allison,

Senior in Agricultural Education, in co-operation with Z. M. Smith, Supervisor of Agricultural Education in Indiana. The contest which was open to all vocational students closed April 26, 1920, in order that all announcements of prize-winners might be made at the Boys' and Girls' Club Round-Up held at Purdue University on May 3-7th.

Local contests were held at the different schools in order to pick out the best manuscript from each school to send to the state contest. In order to secure prompt action and a large number of entrants in each school, subscriptions to various farm papers were given as prizes to schools with 100 per cent. enrollment, according to their promptness in sending in the reports. The report from the

Mooreville High School was the first one to reach us. Each report gave the names of the students and the subjects of all essays.

There were twenty-four schools which submitted manuscripts in the state contests and fourteen of these had 100 per cent. enrollment in the local contests. There was a total of 266 students entered in the local contests.

The manuscripts were first sent to the various departments in the School of Agriculture and were ranked in their order of merit as pertaining to correctness and quality of subject matter. They were then sent to a committee from the English department, where they were graded for grammatical correctness. Here the final ranking was made with due consideration to the previous rating.

The announcement of the prize winners was made at a meeting of the club leaders May 5th. The decision rendered was made by the committees who graded the papers. The following report was made:

First Place: Earl Elliott, Shelbyville—"Securing Disease-Free Seed Corn."

Second Place: Ralph Montgomery, Scottsburg—"What the Farmers' Federation Should Mean to the Farmer."

Third Place: Russell A. Howard, Veedersburg—"How We Are Solving a Big Dairy Problem."

Fourth Place: Lillian Wood, Pendleton—"A Plea for the Dual Purpose Short-horn."

Fifth Place: Charles Ellis, Bremen—"Swine Raising."

Sixth Place: Harold C. Lehman, Warsaw—"Why Boys Leave the Farm."

Seventh Place: Ovid Johnson, Stockwell—"Oat Smut and Its Dry Treatment."

Eighth Place: John Greenwalt, Delphi—"Development of Vocational Agriculture in Delphi High School."

Those essays considered as deserving honorable mention were:

Deloss Frank, Auburn—"Apple Growing in Indiana."

Lester Kellar, Brazil—"Hot Water Method for Treating Seed Wheat."

Fred Fraser, Monticello—"Operating a Mammoth Hatchery."

Harry McPherson, Columbus—"Raising Young Chicks."

The committee expressed themselves

as impressed with the value of the work and recommended that it be continued and extended.

Very liberal awards were made in prizes including cash and standard agricultural text-books amounting to over \$100. In addition, over thirty subscriptions to leading agricultural papers were given. The first prize won by Mr. Elliott from Shelbyville consisted of \$10 and subscriptions to two farm papers. To his school was given a \$30 set of Lippincott's Farm Manuals and two subscriptions to farm papers. Other prizes of corresponding value were given the remaining winners.

Prizes were awarded to encourage interest and competition. However, the prizes should not be the central objective of the contestants. Rather, the very nature of the content should be sufficient to encourage interest and active participation by the students of vocational schools. Those who did not win prizes should not be discouraged. After all, only a few can win, no matter how good every individual manuscript may be. The very fact that the best essay from each school was selected would indicate that all those entered in the State contest were worthy articles, which they indeed proved to be. On the other hand, all contained some grammatical errors which shows there is some room for improvement even in the best articles.

The agricultural work carried on through the clubs and the vocational classes certainly is of tremendous value. Every boy and girl in his and her work comes in contact with real business and social problems in agricultural life. In doing so he is placed upon his own responsibility and must use his own mind and ingenuity to solve all problems and conduct his work efficiently. Because of this boys and girls more and more will take a very definite place in our agricultural life in both business and social relations. They should be privileged to express themselves upon the problems with which they come in contact. It is hoped that in these contests boys and girls will take advantage of this opportunity to express themselves as they see fit. Certainly the more meritorious are

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The Club Round-Up

By Keller E. Beeson, '22.

THE week of May 3-7 marked the largest Club Round-up in the history of vocational work in Indiana. Three hundred and forty-six girls and 374 boys from every part of the State registered. Fountain county led in the enrollment with 59 youngsters, and White county followed with 51.

The program was filled with interesting addresses, demonstrations, debates, inspection trips, hikes, judging contests,

ished a fitting climax to the week of instruction and pleasure combined.

In the state corn judging contest held between the various counties, three members selected by elimination contests in their respective counties formed a team. The five leading counties and their scores follow:

First—Scott	92.3%
Second—Hancock	91.8%
Third—Madison	87.4%



Egg Barbecue at the Club Round-up.

and recreational periods. Monday night was given over to a visit to the Engineering laboratories and shops which were in full operation for the benefit of the visitors. A debate on Tuesday evening on the question of the value of a tractor on a one hundred and twenty acre farm was won by the negative team from Clinton county. Dean Carolyn Shoemaker gave an inspiring address on the life of Theodore Roosevelt on Wednesday night. And on the following night came the great egg barbecue followed by stunts at the pavilion. Sleight of hand, contests for fifty boys, the Purdue band, electrical and chemical displays, a hitching contest, and finally a live stock show furn-

Fourth—Henry	82.7%
Fifth—Montgomery	82.4%

The counties winning in their various sections are as follows:

- Section 1—Noble.
- Section 2—Clinton.
- Section 3—Hancock.
- Section 4—Bartholomew.
- Section 5—Scott.

The Indiana Corn Growers' Trophy Cup was awarded to the winning county, and Fred Campell, of Owens county, was the individual winner.

The baking team from Huntington county, composed of Mildred Baker, Lura Folk, and Mildred Beaver, won first, while individual honors went to Kather-

ine Jones, of the Corydon, Harrison county, vocational class, who scored 92%. The sewing team of the Summitville high school, of Madison county, composed of Irene Webster, Bernice Montgomery, and Esta Reavis won first in that contest, and again Katherine Jones won first individual honors with a score of 99% but as she had already won one first, the award was made to Eloise Niles, of Spencer county, who made a score of 98 4-5.

In the Beef Cattle Judging contest, Har-

ty-one of Indiana's brightest girls and boys produced through home projects \$435,747.14 at a cost of \$188,983.01, leaving a net profit of \$246,764.13.

However the major return from this work is not to be measured in dollars and cents, but in the broadening of these boys and girls, in the developing of their ability to plan and execute, to initiate and complete, to lead and co-operate, and eventually to found better homes and farms.



The Hog Judging Contest.

vey Zenor, of Clay county, won first,—a gold medal given by the National Spotted Poland China Record Association. The Clay county team composed of Harold Pair, Bert Downs, and Harvey Zenor, also won the silver trophy given by the Chester White Record Association. The same associations made the awards in the Swine Judging contest, the individual honors going to Max Hardy, of Madison county, and Arthur Sims, Edward Knapp, and Willard Parvis, of Clinton county, carrying away the county contest. Harold Henderson, of Montgomery county, won the medal in the Dairy Cattle Judging contest, and the Cass county team won first for its county.

Club work has flourished throughout all parts of Indiana during the year 1919. Nineteen thousand one hundred and six-

The development of the qualities of leadership and initiative is shown by the story of Adelle Davis, of Lizton, Hendricks county, and winner of first place in the local sewing contest and of third place in the state contest. Under the direction of the County Home Demonstrator, baking and sewing clubs were organized with a total membership of fourteen. Without local leadership other than that of Adelle and the other officers, a house was obtained and its earlier tenants who were members of the bedbug family, were replaced by the girls after a somewhat strenuous struggle on the part of the girls. Furniture sufficient to furnish a library, lobby, kitchenette, and cloak room was donated, and a real club house opened where the girls could go whenever they pleased, and in which

their entertainments and meetings could be held. Their activities included everything from maintaining lemonade stands to raise money up to giving baking demonstrations and contests for the benefit of their mothers and friends. And their financial activities were sufficiently successful to not only enable them to send part of their club to the Round-up, but to aid in retaining the County Home Demonstrator when lack of funds threatened the loss of that office. Failure of the garden which the girls had attempted to

has he in his son's ability that last year he allowed the boy, who had no similar previous experience, to enter part of their herd in the State Fair, and the boy assumed his part of the responsibility so well that he came home a winner. This was the first herd of the breed in the community, and from it a neighbor obtained a start, and he in conjunction with Wilford held a sale last fall at which the average price was \$57.50 per head, and all of the hogs remained in the immediate community.



Girls scoring bread in the domestic science laboratory.

grow, and the sale of their club house were handicaps that the girls had to meet, and an appreciative friend of the club and father of one of the members came to the rescue in the latter dilemma with a proffer of two rooms, and now the club is comfortably located in two rooms with an anticipated membership of thirty for the year and five rather than two departments.

Ability to co-operate and contribute to the improvement of the live stock of the immediate community is shown in the work of fifteen-year-old Wilford Wene of Pendleton. Last year he entered the sow and litter contest with fifteen head of Big Type Sows, and won first place in the State contest. His father is turning the hog business over completely to the boy while he looks after the feed producing part of the business, and so much faith

The total production from this herd amounted to \$4,500, and a larger sale is being planned for this year. Incidentally several of the major ideas in housing and managing the herd have been obtained at the Round-Up visits to Purdue and have been put into immediate operation, and no prize money is necessary to induce Wilford to attend the Round-Up.

Many stories of similar achievement might be given to show the far-reaching influence of the club work and the desirable effects that it is having upon the lives of boys and girls. Many are being reached through these channels who would never be affected equally through academic teachings, and others are being taught fundamental lessons and principles that would not otherwise be acquired until later life.

Does the United States Need a Wool Tariff?

By R. G. Spears.

However forgetful the American people are inclined to be the great world war has brought home to them a number of important facts that should not soon slip from their minds. Perhaps most important among impressive facts comes the absolute conviction that in all of our National enterprises we must build for permanency if we are to be able to successfully cope with the other nations of the earth and maintain our position as a nation to stand on its feet.

of the government and the passing from periods of protective tariff to free wool the sheep industry has had its ups and downs. The demand changed from the typical wool sheep to the mutton breeds and has now swung back to a type combining both wool and mutton. The price of wool has varied from almost nothing to seventy cents per pound. Mutton has had its periods of good demand and its periods of depression. There has never been a period when the majority of sheep



A small flock on every farm not only fits well into the general farming scheme but will put the sheep industry on the firm footing it deserves.

With the increased interest that is being aroused in commercial enterprise comes a new demand for greater production and stability in agriculture. All who are interested in the great future of our country agree that a better system of permanent agriculture than we have had in the past will be necessary for our growth in the future. Because of its universal utility our wool supply comes in for a large share of attention in the new agricultural program.

The sheep industry in the United States has had a varied and stormy career. With changes in administration

producers were agreed on the best type to produce and before the war there had never been a concentrated National attempt to push the sheep industry.

Since the beginning of the war great changes have been wrought. The supply of wool that had been coming to our manufacturers from Australia and New Zealand was cut off when England commandeered that supply. Our shortage immediately became very acute and as a consequence the price jumped skyward. Production was immediately stimulated and the shortage of breeding stock probably prevented a sudden increase which

would have resulted in overproduction. On the entrance of the United States into the war all of the available wool supply was commandeered by the war department and prices took another upward spurt. Our shortage was acute and had not England allowed us a great supply which came in at a guaranteed price and duty free we would have been unable to adequately clothe our own army.

The war ended and left the United States government with a very large supply of wool on hand. This is being put on the market in very small quantities in order that the wool price will not be shattered. Mutton and wool are still commanding good enough prices that interest in sheep production has not started to decline. The extension men of the U. S. Department of Agriculture are carrying on educational campaigns among sheep producers. Likewise the National Wool Growers' Association is doing great things for the industry. Various breed organizations are very active and are doing good work. Production is being stimulated not only on the range but the corn belt farmers now realize the utility and economy of sheep raising in their system of agriculture. Considered generally it would seem that the sheep industry in the United States has bright days ahead.

But let us not forget the question of foreign competition. Australia and New Zealand are two great countries which produce wool almost exclusively. Before the war we received great quantities of their wool from London markets which made up for our own shortage. Argentina is one of our nearer neighbors who pays great attention to the sheep industry. At the present time South Africa is experiencing rapid growth along lines of sheep husbandry. When one considers these great countries, comparatively new and undeveloped, with the possible exception of Argentina he is apt to conclude that sooner or later they will be able to eliminate American competition and commandeer the wool production of the world. However their possibilities do not seem to be unlimited. The world has not yet more than started to make up the wool shortage brought on by the war and the population is sure to make such growth and added demands for wool

that these foreign countries will not be able to take care of the entire demand.

Even without a tariff on wool the American producer is not apt to experience any bad results for a few years, at least not until the world shortage is made up. It can be only a question of time, however, until foreign wool will begin to appear on our market. One is apt to say "Why shouldn't foreign wool come to our markets if we cannot supply our own demand?" It is well and good for foreign wool to come in but that which does come must not be sold for a lower price than our own product if the industry is to thrive in the United States.

We need a conservative, sane tariff policy, a tariff which will make foreign wool sell in the United States for a high enough price to pay the American producer his cost of production and give him a just and reasonable profit. We cannot hope to compete with foreign sheep men if we have free wool. South Africa, Argentina, Australia, and New Zealand have greater opportunities for expansion than we. The standard of living in these countries cannot be compared with the American standard. It has been shown time after time that these countries can produce wool and send it to the United States much more cheaply than we can produce it here. It is entirely possible that within a few years a policy of free wool may bring about a situation very similar to the one during President Cleveland's administration, when one sheepman said, "I voted for Cleveland and free wool, and I got Cleveland and came within five cents of getting free wool." Of course we cannot think that the price is in any danger whatever of dropping to five cents a pound but a drop to thirty cents now would have much the same effect that a five cent price had then.

The sheep industry is prospering in the United States now. The demand is good for both wool and mutton. The farmers of the corn belt are rapidly realizing the value of the sheep in general agriculture. The prosperity of a great part of the western range is due to the golden hoof. The movement, national in scope that is boosting the sheep industry is rapidly putting

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Standardization of Dress

By Lella R. Gaddis,

(In charge of Home Economics Extension)

THERE'S a reason other than vanity why a woman should be well dressed; it gives her self-confidence and ease of manner. To be well dressed does not necessarily mean expensively dressed.

With the increased demand for the novelties and more expensive materials, one wonders if there is such an article as an inexpensive garment. The reason for high prices of women's clothing is obvious. In relation to value, women pay exorbitantly for ready-made garments. They are not paying for the suit alone, but for all the extra cost to manufacturer, wholesaler and retailer incurred in producing and selling a great number of designs that change with great frequency, and therefore, subject to risk. The solution of this problem would, no doubt, be the adoption of standardized clothing for women and girls.

There is more or less misunderstanding of the term "standardization." Standardization is a principle and not a uniform; it does not mean adopting a single form of dress for every single occasion, but it does mean that women ought to accept a form of street clothes as unchangeable as the man's suit. Women's clothes will not look alike even then, for the difference in color, trimming and fabric will make the variety which is so much desired.

Could women but decide to have and to demand a good straight line tailored suit, what a great saving there would be. The western women and city women are well dressed women, and you will find them buying every two or three years one well tailored suit which, with a fancy blouse, is suitable for luncheon and theater as well as street wear. There is individuality because of color and accessories. On the other hand, we have many women buying perhaps as expensive suits each year, one year the waist line high, the next year the skirt extremely narrow or extremely wide, and in the long run they are not as well dressed.

One style of standardized dress advo-

cated, consists of a skirt either kilted, gathered or gored, and attached to a waist so that the weight falls from the shoulders, yet permits of freedom of motion. The sleeves are either in the waist, or in the tunic. The tunic may be long or short according to the build of the in-



A standardized graduation dress.

dividual. The trimming, collars and cuffs make for individuality.

The accompanying picture is that of one of the Purdue girls who gave much thought and time to the standardized dress problem.

The question of standardized dress for school girls is quite as important as for women. Many of our high school girls are scantily, extravagantly, and ridiculously, dressed. Because of this extravagance many girls are uncomfortable and are barred from high school.

Through the influence of the home economics teacher in Atlanta and Arcadia,

Hamilton County, a few years ago, uniform dress for the high school girls was adopted for both school and commencement. The mothers were first consulted and they endorsed the movement. The initial cost of the dresses was perhaps a little hard on some of the members of the class, but in the long run it was most satisfactory and economical. Linens at that time were to be secured in good, reliable colors. Linen was selected, and Peter Thompson style was agreed upon. Commencement dresses were white with red ties. The dresses were comfortable, were neat and attractive in appearance; there was individuality in the way the dress was worn, and the color of the ties. There was no competition in dress, and these girls were the most wholesome, well dressed school girls I've ever seen.

Not only should there be standardized dress for women and girls, but standardized shoes. The splendid educational

work now being done by our Y. W. C. A.'s and leading magazines along the line of "sane and safe shoes" will certainly reap good results. If the high heeled, light weight leather or kid, thin soled shoe is such a comfortable, sensible shoe, why do men not wear them instead of the low heeled, straight last, heavy soled shoe? Why do we put the "educator" or sensible shoe on the baby and growing child to start the foot right, then allow our high school girls to "tilt" along in high heels and narrow toes? The manufacturer produces the material the public demands, and never before was there a time when home economics trained people needed so much to take a definite stand on the subject of "safe and sane dressing" and standardization of clothing as right now in order to help cut down the high cost of living and to exert their influence towards having healthier, happier and better dressed women and girls.

Forage for Hogs

By G. Thomas '21.

THE producer of market hogs has been feeding for a relatively low market during the past year. The result is that the small breeder and feeder is going out of the business and others are decreasing the scale of their operations. The only thing which the pork producer asks is a price for his product which will return a fair profit over the cost of production. But as long as the price of hogs is fixed by economic conditions quite remote from the cost of production, the farmer must look for the solution of his problems in his own business policies.

At the present time the farmer can make an unusually profitable use of forage in the production of hogs. It is an established fact that when liberal use is made of forage crops the gains are more economical and the labor cost is less. It is the opinion of our own station that forage increases gains 10 to 20 per cent. over the dry lot method. Other advantages are that proper exercise is secured, there is less trouble with worms and other parasites, general health is bettered and the

fertility of the soil is increased. Many farmers are unfamiliar with the best forage crops which accounts for the lack of their more general use.

Rye and vetch or rye alone furnishes the best late fall forage. Rye is sowed at the rate of about two bushels per acre alone; with vetch about one bushel of rye can be used and one-half bushel of vetch. This will furnish forage late in the fall and can be used earlier in the spring than any spring sown crop. A mixture of rape, oats and clover—rape 5 to 7 lbs., oats one bushel, and clover 3 to 4 pounds—makes a good forage crop that can be used till June 1. Clover, either red or sweet, makes an excellent forage crop and can well be used in case of failure of the crop especially intended for forage. Alfalfa is better than any of the above mentioned crops, but it is not grown on many Indiana farms.

Rape is one of the best forage crops because it gives good results and has a wide range of adaptability both as to soil types and time of planting. It will grow on any soil that will produce good corn.

A clay loam is preferred. The soil should be finely prepared because the seeds are small. If the soil is very fertile, as it usually is in an old feed lot, better results will be obtained by planting in rows than by broadcasting. Under ordinary field conditions broadcasting will give a greater yield. Three to four pounds of seed are required for an acre in rows 20 inches or more apart. The hand seeder is the best method of broadcasting, putting on six to eight pounds per acre. Turn on it when it gets about 12 inches high. If the lots are not small use a temporary fence. Alternate from one lot to the other. Palatability is decreased if the growth is more rapid than the rate at which it is taken off. Difficulty is sometimes had in getting hogs to eat rape. Shut them in a lot where there is nothing but rape. When they start eating it, they prefer it to any other forage with the exception probably of soybeans. Rape will furnish forage throughout the entire summer and fall.

Soybeans and cowpeas make excellent forage crops, but they are not very dependable because often a good crop is not secured. Soybeans has the advantage in that it can be planted with corn, which forms a very good balanced ration if the corn is hogged off. The rate of sowing is 25 to 30 pounds per acre if drilled in rows, if broadcasted 1 to 1½ bushel, if

planted with corn 10 to 15 pounds. Turn into the crop when they are well formed and have begun to turn brown.

There are a few general considerations that are true for all forage crops. Best results are obtained when 2 to 3 pounds of concentrates are fed for each 100 pounds of live weight. Even if it is a legume crop a small amount of protein supplement in the form of tankage or some similar material will prove a good investment. After the pigs weigh 150 pounds, they will gain more economically and practically as fast without a concentrate feed as with one. Alfalfa, rape and red clover will carry 15 to 20 mature hogs throughout the summer if it isn't too hot and dry. The amount of forage which an acre will furnish of course depends upon the weather conditions, so sufficient acreage should be used to guard against a poor crop season. The excess can be used as hay, as a soiling crop or even as a green manure. Graze close enough to prevent the plants from becoming tough and woody. Fresh succulent forage is more palatable and is therefore eaten in larger amounts and returns the best gains in the hogs. The success in the use of forage crops for hogs lies in the ability of the farmer to furnish a source of palatable feed throughout the entire growing season.

Notes on the Hessian Fly

(Mayetiola Destructor.)

By J. R. McCoy '21.

PROBABLY no other insect causes more damage to wheat crops of the United States than the Hessian fly. During years when it is excessively abundant, hundreds of thousands of acres of wheat may be either totally destroyed or so badly injured as to reduce the yield 50 to 75 per cent, and the monetary losses expressed in dollars would run far up into the millions.

Since the recent advance in prices of wheat, this crop has become a favorite with corn belt farmers, and the acreage sown has steadily increased, and with this increase there has been a growing abundance of the Hessian fly. In fact farmers have become so familiar with this wheat

parasite that the term "fly" is sufficient explanation when speaking of this pest.

The Hessian fly has been so named because of the belief that it was introduced into the United States, in the straw used by the Hessian troops stationed at Long Island, New York, during the Revolutionary war. This belief was strengthened by the fact that the fly was first found three years later, in the vicinity of the old encampment.

This pest was originally a native of the old world, probably of western Asia, the cradle of primitive wheat culture, though the most certain proofs regarding its early distribution refer to its occurrence in Europe.

The distribution of this insect is quite wide. Outside of America the Hessian fly occurs in North Africa, western Asia, Europe, British Islands, and New Zealand. The territory in North America over which the Hessian fly has spread lies in a solid block, eastward of the 100th meridian, and northward of the 33rd parallel. There is also a narrow strip extending from central California to British Columbia. Its spread has doubtless followed quite closely the world wide movement of its host plants, wheat, rye, and barley. In fact it is found almost in every place where wheat is found, and is capable of

female is red, or yellowish when first hatched from the flaxseed or, pupating cell, the color varying with age, the posterior segments terminating in a compressed cylindrical, very minutely hairy ovipositor, capable of great extension. The male is smaller, more slender, and in color generally darker than the female, the abdomen terminating in a somewhat intricate organ, composed of a set each of outer and inner claspers. During warm days, in the egg laying season (September), the flies may be observed flying about in young wheat, alighting upon the leaves. In cooler days, or in early morn-



Adult Female.



Adult Male of Hessian Fly.

adapting itself to almost all vicissitudes of climate that are not uncongenial to its host plants. Optimum conditions for wheat growth are also optimum conditions for the spread of the pest.

Description of the Insect and where Found.

It is often confusing to the average farmer, to distinguish between the different stages in the development of the Hessian fly, and to recognize the importance and unimportance of these different stages in the control of the pest. For this reason a somewhat extensive description is deemed necessary. The insect is found in four different forms during its lifetime, each entirely different, namely, egg larvae, pupa, and adult.

The fly itself is very small, being only about one-tenth of an inch long, the body of an obscure dark color, possessed of two wings, and the form much like that of a very small mosquito. The abdomen of the

ing while a heavy dew is on, they will be down among the leaves, or even on the ground. Farmers often mistake the Smoky Crane fly for the Hessian fly, which they have observed flying over their wheat fields in great numbers, but they are not hard to distinguish. The Smoky Crane fly somewhat resembles the Hessian fly in form, but it is about eight times as large.

The egg is very minute, being only about one-fiftieth of an inch in length, and one-seventh as wide as long, cylindrical, roundly pointed at the ends. The surface is smooth and shining, the color passing from a thin translucent honey yellow, when newly laid, through orange yellow to reddish as hatching time approaches. They are generally found in the grooves of the upper surface of the leaves, though they are occasionally found on the underside of the leaf. When the young wheat plant is just pushing

through the ground, the egg is sometimes placed on the outside because no leaves are available.

The larva, or maggot when newly hatched is a little smaller than the egg, with a slightly reddish tinge, which changes to a greenish white as it becomes older. When full grown the larvae are about three-sixteenths of an inch long, without legs or a distinct head. These maggots may be found in October near the base of the wheat plant or between the sheath and what is to become the main stalk, absorbing the plant juices. **It is this form that does the greatest damage to wheat.** They may be discovered easily by pulling down the sheath.

After the larva has reached its full growth and the skin has hardened and turned brown, forming a covering known as a puparium, the insect is known as the "flaxseed." The common name is at once suggested by the resemblance of the puparium in form and color to a flaxseed. The true pupa is white in color, and is enclosed in the puparium. This is the dormant stage of the insect. These flaxseeds remain packed tightly away inside the leaf sheath, during the winter months. They vary in number, often as many as a dozen being found together in a single plant.

Life History.

At present all indications point to the probability that the Hessian fly has two generations, at least during favorable seasons, over the entire area of distribution in the United States.

The winter months are passed mostly in the "flaxseed" stage. The adult flies emerge from the puparium during the latter part of April and the first part of May. The Entomology department has been able to find but very few flaxseeds as late as the first week of May, for this year, although depressions on the stems have been noted where the flaxseeds have wintered, showing that infestation occurred, but that the fly had already emerged.

The adult flies deposit their eggs in depressions on leaves generally in the grooves of the upper surface, sometimes singly, but more often in groups of two or three placed end to end in the same furrow. The number of eggs on a single

leaf ranges from one to thirty or more. During her lifetime a single female may lay upwards of two hundred eggs. The egg laying period is generally about two days, after which time the female dies.

The eggs hatch in from four days to two weeks according to the temperature. The young maggot from the hatched eggs works its way downward to the main stalk, and following the course already started, disappears downward inside the leaf sheath, or in other words between the sheath and what is to become the main stalk. Here it feeds on plant juices, which it causes to exude, and gradually attains a size of about 3-20 of an inch.

At this time the maggot forms a new skin inside the outer one, just as if it were going to molt, but instead of shedding the old outer covering, the maggot merely shrinks away from it, remaining inside and the outer covering turns brown or almost black. It is again in the flaxseed or dormant stage.

The flies remain in the dormant stage during the summer months, often in the stubble until September, when new adults emerge.

These adults lay their eggs on new wheat, which hatch in from four days to two weeks. The larvae or maggots then migrate down the stem and feed until about two-thirds grown, when they again form "flaxseeds" and hibernate until the following spring.

Control.

In combating any insect pest if possible, it is essential to know how the insect attacks the host, so a brief discussion of the nature of injury is given.

As has been stated before it is the larvae or maggots that injure the wheat plant. The effect of the larvae on the young wheat plant is very marked, and becomes observable after the young reach the stem under the sheath. They produce a yellowish color and a general drooping effect.

Wheat plants are affected both directly and indirectly. They are directly affected because the young larvae or maggots take so much nutriment from the plants that these die. Again plants are so weakened by the presence of maggots that less grain is produced. The

wheat yield is indirectly affected because the weakened plants bend or break at the joints at harvest, causing them to fall. Lodging of wheat always accompanies injury by the Hessian fly.

The old adage "an ounce of prevention is worth a pound of cure" is no more true in the case of the Hessian fly than in the case of any other insect pest. The remedies are entirely preventive, in fact after the Hessian fly has once thoroughly infested the crop of wheat there is no known means of saving it, and the only known means of preventing damage from the fly is to keep it out of the wheat.

For this reason the young wheat should be examined thoroughly in order that the presence of the brown "flaxseeds" may be detected late in winter or very early in the spring, and if these are found to be present in large numbers it will pay to plow down the wheat at once and prepare to plant corn, oats, or some other crop in its place. In this way the fertilizing value of the green crop will be retained in the soil and it will be possible to secure a crop of grain or vegetables from the field during the current year.

After harvest is the best time to take measures against the Hessian fly. As soon as practicable after the crop is removed, plow the wheat stubble down deeply, at least five inches deep if possible, in order to destroy the maggots and "flaxseeds" which may remain in it. This is for the protection of future crops.

Another practice is to burn the stubble after the crop is removed, but this practice is objectionable because it does not get all of the "flaxseeds", since some are on the plants below the soil, and again there is a loss of plant food by burning.

All volunteer wheat should be destroyed by plowing or disking, as such wheat serves to carry the flies over from fall to spring. One field in which volunteer wheat is allowed to remain may breed enough Hessian flies to infest a whole neighborhood where the grain is otherwise free from the fly.

Pay great attention to the preparation of the seed bed for the wheat by plowing early and working and packing the soil thoroughly in order to eliminate lumps and clods, thus producing a finely pulverized, compact and moisture-conserving bed for the seed.

The sowing of wheat should be postponed until the adult flies have emerged and laid their eggs, but the seeding should not be postponed so late that the young wheat plants cannot get a good growth before winter sets in, as extremely late sowing would be even worse than early sowing if the flies are not especially numerous. The practice of sowing a narrow strip entirely around the field to catch the fly is sometimes followed. After the flies have laid their eggs this strip is plowed under and the entire field is then seeded. The exact fly-free dates vary with different localities. Northern fields can be sown earlier. In northern Michigan wheat can be sown as early as the first of September, while in Tennessee the 15th of October is best. In Indiana the time varies all the way from the 16th of September to the 15th of October, depending to some extent on the latitude.

A good rotation should be followed, as this causes the fly to travel greater distances to reach young wheat plants. This coupled with the fact that they will be longer exposed to the elements as rains and strong wind greatly increases their mortality.

It is also essential to secure the co-operation of the entire community in combating this insect pest, for one field containing a great number of the flies may be sufficient to infest the entire neighborhood.

Enriching the soil is of some aid in combating the pest in that it encourages a good growth of the wheat plant which will have a stronger vitality to resist the depredations of the insect than will plants grown on weak and impoverished soils.

Many farmers believe that a few sharp frosts will check the work of the fly, and it would seem reasonable that such frosts, coming between the laying of the egg on the exposed surface of the leaf and the safe housing of the maggot at the base of the stem, might have such effect, but enough flies will be able to escape to again restock. Frost, however, is beyond human control, nor can we predict its coming far in advance to be of any service in this matter. The chief value of exact knowledge on this point would be to en-

(Continued on page 542)

The Twelfth Annual Purdue Egg Show

By R. T. Kelsey, '23.

THE twelfth annual exhibition of the Purdue Egg Show was held May 3-6 of this year. Since 1908 when the first show was held the show has grown each succeeding year and this year it was the biggest exhibition of its kind in this country.

A total of four hundred and sixty-five entries were received and well over four hundred dozen of eggs were on exhibition. Also many freek and unique eggs of every size, shape and description were shown. Eggs were received not only from every part of Indiana, but from Massachusetts and from Idaho, from North Carolina and from British Columbia, Canada, giving this show a more than state-wide reputation. Many eggs were entered by the winners of egg shows held in the high schools of the state under the supervision of the vocational teachers. The boys' and girls' class had the largest number of entries as eight hundred boys and girls, who were winners in the various clubs over the state, were in attendance for the round-up held the same week and a great number brought eggs to be exhibited.

The object in holding the show was, primarily, to encourage and to promote a general interest in the production of more and better eggs in the state of Indiana, to give an instructive exhibition of the best methods of sorting, selecting, packing and marketing eggs, and lastly, to bring the people of Indiana, especially the boys and girls who are interested in the farm, in closer touch with the work of Purdue University along agricultural lines.

In addition to the eggs shown there were exhibits of educational value from every department of the University and from several poultry packing and wholesale houses showing the particular work of each.

One of the principal features of the show was the egg judging contest in which twenty-two county teams were entered. The Madison county team was first with a score of 86.3; Tipton county second, and Grant county third. Mary

Phillips, Amo, Ind., won in individual judging with a score of 98.8. There was also a judging contest for Purdue students and guessing contests for all which were both instructive and amusing. About four thousand people attended the show and much interest was shown by the visitors. The judging and scoring was done by W. C. Jacques, of Thorntown, and B. W. Bogan, of Lafayette.

The winners of the various classes were:

University class, University of Idaho, score 98. Student class, C. B. Bouton, class of 1921, score 99¼. G. E. Young, class of 1923, score 98½. Governors' class, Gov. F. D. Gardner, of Missouri.

Commercial class, Charles T. Beck, Lafayette, Ind., score 98½. Fanciers' class, E. M. Cox, Kingman, Ind., score 98½. High school class, Charles Heller, Mount Comfort, Ind., score 98½—also winning the Purdue Extension Trophy cup for his high school. Grade school class, Marvin Isfalt, Clark's Hill, Ind., score 98½.

Section III, which comprises the central part of the state, showed the largest number of eggs both in the high school and grade school classes.

In addition to the \$75 worth of ribbons, there were thirty-four silver cups valued at \$250, over \$100 in cash, and many other substantial prizes offered as premiums to the winners.

The Purdue Egg Show is put on entirely by Freshmen enrolled in the School of Agriculture and is one of the important activities of the college year. The Freshmen were especially interested in the show as was shown by the large percentage of the members exhibiting eggs. The finances necessary for the running expenses of the show were obtained by the sale of advertising space in the catalogue and by donations from poultry producers and dealers and the Freshman class in Agriculture.

The 1920 Egg Show was officially closed with a big egg roast and get-together meeting held in the woods west of the Purdue farm, Saturday evening, May 14. All the Freshman Ags were present.

The Importation of Dairy Cattle

By Donald C. Badger, '21.

THE question has often been asked, if Guernsey and Jersey cattle in the United States are so far superior to the Island bred stock, why is so much importing of these breeds carried on? This is due to several reasons of which might be mentioned first, the comparatively low prices for which animals may be purchased on the Islands, as compared to the prices demanded in this country. This is due to the fact that the animals on the Islands have not had the opportunity for development that is usually given in the United States. The Island of Jersey has an area of some 36,680 acres of which about 25,000 acres are tillable, and a population of about 60,000. The Island of Guernsey has an area of about 16,000 acres of which about 12,000 are tillable, and a large percentage of this is under glass. The island has a population of about 41,000. From these data it can easily be seen that with such large populations and the limited areas, there is not much room for the development of dairy cattle as we know it in this country. These restricted areas will not grow enough feed for this number of cows and as a result all concentrates must be imported, and are fed in relatively small amounts. These factors have a direct influence upon the size of the animals, and hence we have two distinct types of these breeds—the Island Type (small), and the American Type (large).

Another reason for importing this stock is that the blood on the Islands is very good, and well-bred animals under American management can be developed into high producers and show winners. Our method of feeding, which has become a science in itself, is by far superior to the Island methods, and feeders have everything in their favor—plenty of room, plenty of feed, and the results of others' experiences.

Cattle bought on the Island, one or two from each farmer, are concentrated at one of the Island's ports and shipped across the channel to some English port where they are loaded on to one of the trans-Atlantic liners for shipment to the States. These latter ships are of the reg-

ular cattle type and are small and slow—it usually requiring from ten to fourteen days to make the voyage. The care given the animals on such a trip leaves much to be desired, since men desiring passage across the ocean and return, are hired, so when the ship reaches the American port the effect of the voyage and poor treatment enroute is quite evident.

There are, at present, three quarantine stations in this country, located at Boston, New York, and Baltimore, and cattle are received at all of these during the greater part of the year. It is also not uncommon for importations to be received via Quebec, Canada, where another large quarantine station is located. The writer has had experience only at the New York quarantine, so what follows has to do only with that station, although similar conditions prevail at the other stations.

When the cattle boat arrives in port it usually requires from twenty-four to thirty-six hours for the port officials to make their inspections before the unloading can be started. The government veterinarian at the quarantine station makes all necessary preparations for the transportation of the cattle from the ship to the quarantine station, so when the unloading begins, lighters loaded with box cars are ready at the docks. Several breeds of cattle are usually found in the same shipment but Jerseys, Guernseys, Ayrshires, Angus and Shorthorns predominate. All men on hand for the handling of the cattle combine their efforts and work until the ship is unloaded. Considerable excitement is always in store for the men as they bring the cows down the gang plank, for after being tied in a poorly ventilated ship for about two weeks, each animal, upon the sight of sunlight and a breath of fresh air, seems to have an inherent desire to test its strength. Some take it easily while others will shoot down the gang plank and across the pier at about fifty miles an hour. If the man on the other end of the rope is a good runner he may be able to stick with his prize, if not, there is nothing.

(Continued on page 530)

THE PURDUE AGRICULTURIST

Published monthly during the school year, by Agricultural Students
of Purdue University, LaFayette, Indiana.

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The purpose of THE PURDUE AGRICULTURIST is to disseminate the latest scientific knowledge concerning Agriculture and Home Economics, to incite the young people of Indiana to a greater desire for training in Agriculture and in the industrial pursuits, to publish matters of interest concerning the Purdue School of Agriculture and the Purdue Experiment Station, and to afford opportunity to the students for training in Agricultural journalism.

THE NEW STAFF

With this issue, the newly elected staff assume the duties and responsibilities incident to the publishing of the Agriculturist during the coming year. Upon our predecessors was thrust the difficult task of lifting the publication from the chaotic conditions caused by the war to its present high level. And because of the able manner in which they achieved this thing, we extend to them our heartiest congratulations. But now University conditions are more stable and settled. To us comes as a challenge, the duty of maintaining or if possible, even exceeding the high standards of the outgoing staff.

It shall be our ambition to make the Agriculturist truly representative of both the farmers of Indiana and the agricultural activities of Purdue. If we can convey to the farmers of the state, the latest finding in scientific Agriculture and Home Economics; if we succeed in arousing in the young men and women of Indiana, a greater desire for an agricultural college education; or if we can serve in any other way, the rural interests of "Indiana Folks", so that they shall realize more fully the true worth of our Institution; then will we feel that our aims have been accomplished in some degree.

With this in mind, we solicit the co-operation of the students and faculty of the University, and also the support of the

farmers and alumni throughout the state. May we work together in boosting the Agriculturist and Purdue University, to the end that Indiana agriculture and Indiana farmers may be rendered even greater service than in the past.

THE CATTLE FEEDERS' MEETING

Friday, May 14, Indiana cattle feeders met at the Livestock Pavilion to study the results obtained from the five months' feeding experiment conducted by Prof. F. G. King, of the Experiment Station. The day was ideal and the recent rainy weather resulted in a large turnout of farmers and feeders.

This year the status of steer feeding has been very uncertain, and the results have been awaited with much interest. Some of the outstanding features of this year's experiments are:

1. All lots were fed at a financial loss.
2. Lot No. 2, fed no corn, made cheaper gains than lot No. 1, fed on shelled corn the last 60 days of the period.
3. Lot No. 3 made cheaper gains on a half feed of corn than did lot No. 4 on a full feed of corn.

4. Straight corn silage gave practically as good results as corn-soybean silage. A detailed report of the entire feeding trial will be issued later in bulletin form.

These annual feeding experiments, conducted for several years, have placed the

Indiana Station in the front rank as regards this particular line of investigation. The losses this year are typical of the results of practical feeders throughout the state. The price of fat cattle is entirely out of line with the prices of feeds, feeder cattle and other costs. The consuming public must realize that farmers and feeders cannot continue in business very long unless farming and feeding afford a profit. It was the general opinion, freely expressed, that the uncertainty of the cattle feeder's position was ample reason for adopting a conservative policy for the present, at least.

THE PURDUE UNION

Within the next few months, the greatest forward movement which Purdue has made in a decade will be launched. The University has made an enviable reputation, among her sister institutions, among the farmers of the state who are turning to her more and more for guidance, and among her students who have learned to love her and her traditions. This record of achievement is the more remarkable in consideration of the fact that it was made under a great handicap. Purdue has ever labored under the difficulty of lack of sufficient funds and equipment to properly carry on her work. But she has proven herself worthy in every test.

This state of affairs has come to a climax and Purdue must call for some of the assistance which she has so rightfully earned by her long record of service. In the near future the alumni will be organized throughout the state to back their Alma Mater. Let every man or woman who has been aided by Purdue or who realizes the good work she is doing constitute himself a committee of one to back her financially by material gifts, and morally by making our legislators realize the need for greater funds and equipment with which to continue her good work. Let every Purdue alumnus get behind the Purdue Union and put the Union building across with a boom. Thus the institution may render an even greater service to the people of the state in the future than in the past.

THE INDIANA FEDERATION OF FARMERS' ASSOCIATIONS

It has long been charged by economists and business men, that farmers do not know the value of organization. But during the past year Indiana farmers have created a state organization that conclusively proves that the old indictment is no longer entirely true. The Indiana Federation of Farmers' Associations was organized at Indianapolis, March 25, 1919, with John D. Brown, of Monon, as president, and Lewis Taylor, of Newberg, as secretary. The state was divided into ten districts, each of which has one director on the State Board. This Board of Directors and the officers constitute the governing body, with headquarters at 147 East Market street, Indianapolis.

The first big problem confronting the new organization was to finance its activities. This was accomplished by means of a voluntary guarantee fund.

The second big problem was to carry on a campaign of organization in the several counties of the state. This work has been done so thoroughly that eighty-three counties are now organized and affiliated with the State Federation.

The next phase of the movement was the campaign for membership in each county. This was the real test, submitting the entire proposition to the farmers for their approval or disapproval. The drive thus far has been very successful, some counties securing as many as 1,800 members, and some townships having every farmer enrolled. It will continue till November.

The fourth and biggest problem was to outline a constructive program of work, the achievement of which would justify the existence of both the state and county organizations. The problems attacked have been those relating to taxation, road construction, and the marketing of farm products, especially livestock. A distinctly valuable service was rendered during the past fall marketing season in procuring cars for the shipping of livestock. The field of usefulness for such an association, dealing as it does with the big problems of agriculture is practically unlimited.

Alumni and Local

PROM WEEK A SUCCESS.

The annual Junior Promenade, given by the class of '21, was a decided success, as credited by student and faculty sentiment. Many features besides the Prom were in evidence. Purdue played the strong Iowa baseball aggregation a tie game, 1-1, 12 innings, Friday afternoon, the game being called on account of darkness. The big Prom Review of all units of the Purdue R. O. T. C. Saturday morning, showed the Military Department in its best light

The Prom and week end activities were in charge of the following Prom committee: Mary Prater, chairman; H. R. Holford, D. M. Patrick, H. H. Hawisher, G. L. Fisher and H. A. Williams.

SPRING FOOTBALL UNCOVERS WEALTH OF MATERIAL

Spring football practice at Purdue has been carried on very much in earnest and with very pleasing results for the past two months. Practice in tackling, block-



The spring football squad.

as a necessary and efficient organization. Saturday night a special Prom show under the management of the Purdue Union was the attraction. This play, written by Maud Adams, was staged by the Duzer-Du Dramatic fraternity of DePauw University, in a very creditable manner, and was heartily enjoyed by the large crowd in attendance. The Prom itself, as a feature attraction of the week, was indeed what the name implies. Many new and novel ideas were featured throughout in plans of organization, decoration, and special features. Parker's Popular Players, a colored orchestra from Columbus, Ohio, furnished music of that class and quality never before equaled at a University function.

ing, running down punts and passes, and scrimmaging has constituted the work. Coach A. L. Scanlon has been drilling his huskies thoroughly on the rudimentary points of football, and not only has had almost all of his last year's squad out, but has developed his Freshman Varsity squad and green material into at least a semblance of seasoned warriors.

A PURDUE UNION BUILDING BY 1921

With the coming to the University of Stanley Green '18, as Executive Secretary of the Purdue Union Committee, things began to move forthwith. On April 14, the following Student Committee was elected: F. L. Coffing, G. W. Pilcher, C.

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A message has been sent to the Alumni Association of each county represented in the student body, requesting them to have a mass meeting on May 6, or Purdue day anniversary, and if they do not have a permanent organization, to organize immediately. This message has been responded to wonderfully by the various county alumni and the students from the various counties throughout the state have sent telegrams congratulating them on their ready response and urging them on to still greater activity. The goal is

\$500,000 for a Memorial Union building that will be of adequate size to accommodate the entire student body by 1921, and that will incorporate the following features: 1. Theare, 2. Lobby, 3. Cafeteria and Lunch Room, 4. Main Dining Hall, 5. Special Dining Rooms, 6. Dance Hall, 7. Billiard, Pool Room and Bowling Alleys, 8. Offices for Student Activities, 9. Conference Rooms, 10. Purdue Union Officers, Information Bureau, etc.

GOVERNMENT INSPECTS PURDUE R. O. T. C.

The entire R. O. T. C. of Purdue University was inspected by the Government Inspecting Board of Land Grant Schools under Col. Merry, Monday and Tuesday, the 3rd and 4th of May.

In addition to the regular features, were seen Crack Squad Drill, two entire batteries went through shelter tent maneuvers, practicing firing, and special order drill.

The official report of the Inspecting Board has not been made, but Col. Merry, the officer in charge, expressed himself personally as being more than pleased with the showing made.

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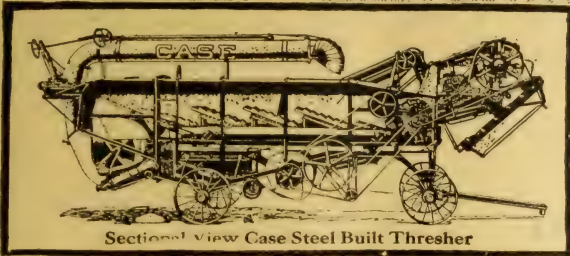
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PURDUE DOWNS INDIANA IN TRACK MEET.

Purdue beat Indiana in a dual track meet by the close score of 67 1-3, to 63 2-3. The meet was characterized by rivalry, but this was the friendly sort of rivalry. We are glad to see the two state schools once more on a basis of friendship.

PURDUE IS BEATEN BY MAROONS IN CLOSE MEET.

Chicago took a fast and close track meet from Purdue by the score of 73½ to 61½ Saturday, May 8. The meet was characterized by the superiority of Purdue in the field events, in which they won practically all first and second places, but they were not able to compete successfully with the Chicago track men, only gaining one first place in the track events. Miller, the big back guard on Purdue's basketball team, was the star of the track meet, winning four firsts. He won the broad jump, discus, shot put, and broke the Conference record in the javelin throw by 17 feet. The former Conference record for javelin was 162 feet and 8 inches. Miller threw the javelin 179 feet and 10 inches. This practically cinches the big athlete's chances of appearing in the Olympic games next August.

C. M. Job, '17, is now the County Agent of Bartholomew county, and his postoffice address is Columbus, Ind.

O. W. Mansfield, '18, is County Agent of Blackford county, with postoffice address at Hartford City, Ind.

A. L. Hodgson, '16, is County Agent of Carroll county, postoffice address at Delphi, Ind.

V. J. Mann, '15, is now County Agent of Clark county, with postoffice address at Charlestown, Ind.

THE IMPORTATION OF DAIRY CAT- TLE.

(Continued from page 523)

ing to do but let her go, and then catch her as best he can.

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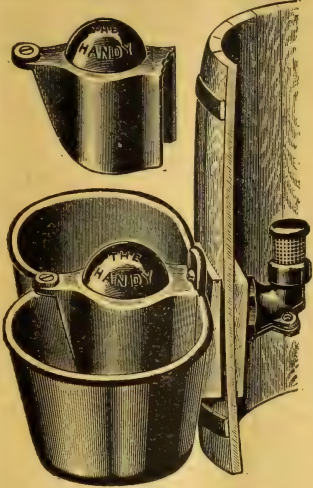
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Bulk, 1 gal. or larger

To properly ripen the cream for butter, and the milk for cheese and commercial buttermilk, use Hansen's Lactic Ferment Culture.

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Interesting treatise "The Story of Cheese"
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is the most wonderful feeder on the market. Will feed down and out all kinds of feed better than any other feeder. Write for catalogue today.

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Patented, just out, is a simple, ingenious, durable, metal device, and when installed in Ford or Chevrolet Manifold really truly gives 15% or more miles each gallon gas. Scientifically and mechanically correct in principle and action. Wonderful opportunity for returning students introduce home town getting big profits. Carry six in vest pocket. Retail \$2.00. Write today specifying town and county wanted.

GaZaV COMPANY, Saint Louis, Mo.

river and docked at Hoboken, where a switch engine draws the cars up into the railroad yards and the train is made up. The quarantine station is only about eighteen miles from New York City, but due to the great numbers of commutation trains radiating from Jersey City to different points of Greater New York, travel is slow, and if the eighteen miles is made in ten hours that is considered good time. You arrive at the quarantine, the cattle are led to the barns assigned to each importer by the veterinarian, and there they live for the next thirty days. The barns are modern and well built and surrounding each one is a small lot in which a minimum amount of exercise may be given.

The object of quarantining the animals is to prevent any contagious disease from spreading throughout the country before it is too late to check it, and thirty days is considered sufficient for any development of this kind to show up. This system has proved an efficient means of keeping this country practically free from the foot-and-mouth disease which is so prevalent on the Islands and in England. During the course of the quarantine the cattle are examined daily by the government surgeon and a tuberculosis test is made sometime prior to the release of each shipment. Only those men caring for the animals are allowed within the confines of the station, so the herdsmen have full sway at all times. Due to the fact that the animals are usually in rather poor condition at the beginning of the quarantine, heavy feeding is always practiced, and it is desired to have the animals looking as good as possible by the time of release.

During the last week of the quarantine period, representatives of the various breed associations are allowed entrance to the station for the purpose of identifying the animals and making such reports as are necessary. Then the day before release, owners and prospective buyers are allowed to enter for the transaction of business, for a good many animals are sold at this time and then shipped directly to their destination. Those that are not sold are shipped to the importer's farm as soon as the release is declared.

Oliver



Preparing Seed Beds

with Oliver tractor plows reduces the time and labor required for accomplishing quality work.

Oliver tractor plows can be used with any standard make of tractor. They are equipped with Oliver combined rolling coulters and jointers and Oliver bottoms particularly designed for your soil conditions.

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If you are interested in printing, we will be glad to show you through our plant. Here you will find the modern methods of printing and the newest types of machinery and equipment; you can see type being made; typesetting machines; big presses running at high speed and fed automatically; you can learn how books are manufactured and bound; see sewing machines, stripping machines, etc., etc.

Whether your printing account is comparatively small or large, you will see the advantages of having your printing done in a modern factory.



***A Stationery and
Office Supply
Department,
Heavily Stocked, is
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DRY SULFUR PREPARATIONS vs. LIME SULFUR SOLUTIONS

DURING the last two or three years several companies engaged in the manufacture of spray materials have been putting on the market dry sulfur compounds which they claim when mixed with water form sprays as efficient or more so than the home made lime sulfur or the commercial lime sulfur solutions. These companies have thrown the weight of their advertising toward the sale of these dry compounds and this combined with several obvious advantages of the dry material has increased its use to such an extent that the manufacturers claim that it will entirely supplant the old form in the course of two or three years.

It cannot be denied that the concentrated solution has several disadvantages, such as an offensive odor in the store-room from leaky barrels, danger of freezing in winter and the size and weight of the barrels which make handling an expensive operation.

A few of the many advantages which salesmen claim for the dry compounds are, a smaller freight bill since one is not obliged to pay for water, less storage space required, no danger from freezing, and packages are of convenient size and easy to handle. They also claim that the spray made from the dry lime sulfur has a greater spreading and wetting power than that made from the old form and that the film resulting from such a spray is less permeable to decomposing gases and vapors. For this reason they say that while the part in contact with the insect is decomposed by the gases given off in transpiration, the toxic vapors produced will be held in contact with the insect longer and so have greater killing power. The salesmen claim that this together with the fact that it is in a finer state of division than the liquid form and so more toxic makes it possible to get the same control by the application of less material than is usually recommended for sprays made with the lime sulfur solutions.

The salesmen fail to point out to you, however, that the dry compound is invariably more expensive and that the efficiency of the spray solution resulting

MOLINE

The Universal Tractor



THE Moline Universal Tractor makes possible a real system of Power Farming instead of tractor plus horse farming. It does not reverse the old-established order of farming. It does not add expense—but cuts it.

It places the power of nine big horses where the horses stood. It is operated in the same manner as horses—from the seat of the implement. And it does all the field work that horses do, including cultivation of row crops.

It adds more power and speed to an old principle. And if this principle isn't correct, then farming has always been done backward, and you would be operating your implements

from the horse's back instead of from the seat of the implement. Saddles instead of seats would have been in general use.

This is the reason for the great success of the Moline Tractor. It is built on the correct principle. One man with one tractor does all field work from plowing to harvest.

Moline Power Farmers are increasing production and decreasing the cost of production.

The Moline System of Power Farming offers a particularly helpful solution of the farm labor problem.

You will find the Moline Universal Tractor a sure, safe, satisfactory and highly profitable investment.

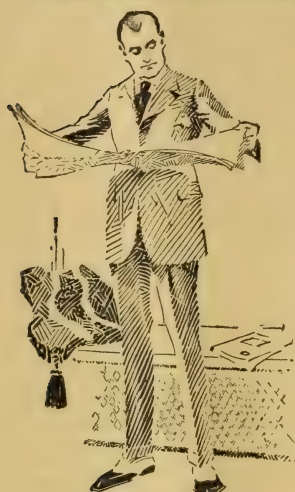
MOLINE PLOW COMPANY, Moline, Illinois

Branches at Atlanta, New Orleans, Dallas, Oklahoma City, St. Louis, Poughkeepsie, N. Y., Baltimore, Los Angeles, Stockton, Cal., Spokane, Portland, Salt Lake City, Denver, Kansas City, Omaha, Minneapolis, Minn., N. D., Sioux Falls, S. D., Des Moines, Bloomington, Ill., Indianapolis, Columbus, Ohio, Jackson, Mich., Memphis, Tenn.



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is a wonder.
It keeps the
water warm
in winter, cool
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Can move
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Write for catalogue today.

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LaFayette Milling Co.

Manufacturers of the following
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FLOUR

"LAFAYETTE MILLING CO.'S
BEST"

"SILVER MOON"

"WEDDING CAKE"

"SNOW FLAKE"

from its use is greatly lowered. This means that the grower is paying a high price for convenience.

The active agents in lime sulfur for scale control are the polysulfides and thio-sulfates, so the relative amounts of these contained in the spray is at present the only adequate basis we have for comparison. According to investigations made by the Insecticide and Fungicide Laboratory of the University of California, one hundred pounds of active sulfur will cost just a little over twice as much when bought as dry lime sulfur as when obtained in the form of the thirty-three degree Baume, concentrated solution. So far as can be observed the dry form when dissolved in water will produce a spray in all respects similar to the usual dilution of lime sulfur solution, provided equivalent quantities are used. The manufacturers' directions for winter spraying call for ten or twelve pounds dry lime sulfur to fifty gallons of water which will give a solution containing only about half as much active sulfur as may be found in the one to ten dilution of lime sulfur solution. Mr. Olney of the University of Kentucky reports that in a laboratory trial, a solution of twelve pounds of dry lime sulfur to fifty gallons of water tested only two and one-half degrees Baume. As the usual recommendation for the dormant spray is five degrees Baume or one part of thirty-two degrees concentrated solution to eight parts of water, thirty-two pounds of the dry material would be required per fifty gallons water to get the desired strength. In this test the dry compound was ground with a mortar and pestle and the solution stirred frequently in order to make a fair comparison. In defense of these half-strength recommendations, the manufacturers claim that a certain organic material in the dry compound prolongs its effectiveness so much that less than the usual amount of sulfur is required.

Thus far the field tests carried on by Experiment Stations have not continued long enough for the public to secure definite reports as to the comparative effectiveness of these dry substitutes. Until field experiments show that the manufacturers' claims for effectiveness can be

ANDERSON TRENTON ROCK CRUDE OIL

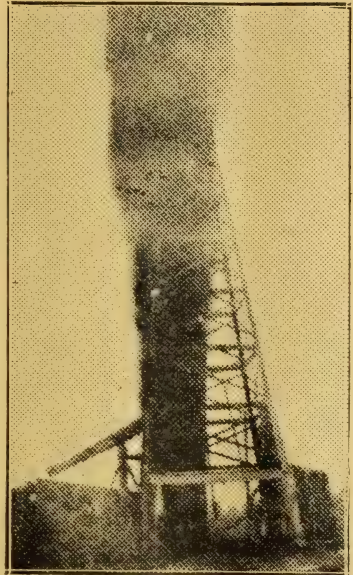
NATURE'S PRODUCT THE HOG RAISER'S FRIEND

The greatest disease preventer known to successful hog raisers, as well as poultry raisers. Destroys the nits as well as the lice, prevents diseases, cures mange and scurvy, makes slick coats, repels flies and insects. Less disease among hogs in the Trenton Rock Oil fields of Ohio and Indiana than anywhere else in the United States. Trenton Rock Crude Oil is recommended by all the Agricultural Universities and by the United States Agricultural Department. Trenton Rock Oil can be used for farm machinery. Is very useful on the farm. Good for man or beast. Comes in 5 and 10 gallon cans, wood barrels, 30, 50 and 55 gallon drums. Special prices to dealers. Write for circular and prices.

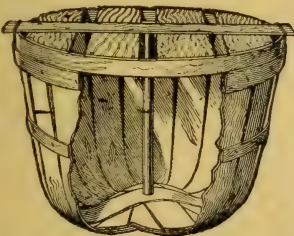
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This is the day when the agriculturist looks at his shipments to market from the standpoint of his net profit. The

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Write today for booklet "Shipping Profits." Shows how Universal Package saves money, labor, time. Better net profits proven. Valuable data every grower, shipper and receiver should have.

pays the best net profits because it carries, saves time packing, saves labor, carries safely, gets best prices at market. It is uniformly best for all fruits and vegetables. Ask for booklet: "Shipping Profits," showing how.

Package Sales Corporation
112 E. Jefferson St. South Bend, Ind.

supported in the quality of crops produced, the only safe method of procedure for any grower is to valuate these dry preparations of sulfur on the basis of the percentage of sulfur combined in the forms of polysulfides and thiosulfates. The fruit growers cannot afford to set aside, for the sake of convenience, a well established and fairly well tested spray practice and reduce their remedies to half strength, unless this has been shown to be desirable by experiments of the most convincing sort.

PURDUE AGRICULTURIST ESSAY CONTEST

Continued from page 510)

articles are deserving of publicity. The Agriculturist will publish some of these articles.

It is certainly desirable that the students in vocational agriculture and the

club members, and the School of Agriculture at Purdue be brought as close together as possible. All are working for a common end in the advancement of the science of agriculture and the betterment of country life. The Annual Round-Up of Boys' and Girls' Clubs at Purdue is an aid in this. It is hoped that the Purdue Agriculturist may further aid in this work.

Many of the club members and vocational students will be future students at Purdue. We want them to be interested in us and to feel that we are interested in them.

The Agriculturist will endeavor to serve the club members and students in vocational agriculture in the attempt to reach the common end in the development of scientific agriculture and a better country life in Indiana.

The Dairy Department is in receipt of a set of apparatus for carbonating ice cream. It was loaned the university by the American Conservation Service, and is to be used in a series of experiments in ice cream making to be started soon.

The State College of Agriculture at Cornell has been voted an appropriation of \$1,787,888, of which \$517,000 is for the erection of new buildings. They have also been authorized to enter into contracts for \$3,000,000 in construction of new buildings. It is to be hoped that Purdue will receive the benefits of similar legislation.

MIAMI CONSERVANCY

Inexhaustible Farms

Rich corn farms—kept perpetually fertile by alluvial deposits—without manure or fertilizer. For sale by The Miami Conservancy District (a subdivision of the State of Ohio). For information write to OFFICE P, MIAMI CONSERVANCY DISTRICT, DAYTON, OHIO.

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For Chicken Lice, use

Talcimized Sodium Fluoride

The Sodium Fluoride method is the dependable, easy way of killing lice on poultry, recommended by the U. S. Dept. of Agriculture, Purdue University, and other leading agricultural colleges. Sodium Fluoride not only kills all lice at the time of application, but also destroys the young lice which come from the eggs present at time of treatment.

Talcimized Sodium Fluoride is specially prepared by us for poultry use, is non-irritating, economical and very convenient. In handy $\frac{1}{2}$ lb. package, 35c.

If your druggist or poultry remedy dealer hasn't it, we will send it by mail prepaid on receipt of price.

Burrell-Dugger Company

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Indianapolis, Ind.

Dairy Science

When the Agricultural Colleges entered the field of Dairy Husbandry they turned the light of science upon this industrial field with the result that better methods of manufacture and high grade products are made possible.

Among these better methods none appear to be more important or more necessary than sanitary cleanliness, if good results are to be obtained, and the use of



is recommended by the Agricultural Colleges of the United States and Canada, because the fresh, wholesome, sanitary cleanliness this cleaner provides is not only an adequate protection to the dairy from insanitation, but is also proving most efficient and economical.

Order from your supply house.

It cleans clean.

Indian in
circle



in every
package.

THE J. B. FORD CO.,
Sole Mnfrs., Wyandotte, Mich.

DOES THE UNITED STATES NEED A WOOL TARIFF?

(Continued from page 515)

the industry on a permanent basis. A sane conservative tariff on wool will protect the American producer to the extent that if another national crisis similar to the great war should ever come the United States will have a sheep industry which is a great national asset. It will have a system of agriculture which is well balanced and which will make for efficiency of production. Increased sheep production is vital to permanent and stable agriculture. A tariff will make possible that increased production. We must have a permanent wool tariff if we would see our nation prosper as it should.

FARMING IN THE RIO GRANDE VALLEY, TEXAS.

(Continued from page 509)

the river. Americans enjoy their little trips into Mexico (especially when they are thirsty).

Deer, ducks, geese, quail, Mexican pigeons, or white wings as they are sometimes called, and other game furnish excellent hunting for the sportsman. The Mexican pigeons come across the river in large numbers in the spring for nesting. Their meat is very fine eating.

This country is not a paradise by any means, but the value of land is determined by its producing ability, and this is the cheapest land I know of anywhere. There are people who make a failure here, but you will find that any place, and if a person is willing to come here and has the nerve to stick, he is sure to win. The highest priced land that is changing hands at present is between local men, which fact is a good indication of their judgment as to the future of this country.

Now I am no land agent and have no land to sell. I am just an ordinary farmer who completed the Purdue Short Course in 1907. So I naturally have a deep interest in Purdue students. There may be some statements in this article that are hard to swallow, but seeing is believing.

Blow your own horn but change the tune occasionally.



**SPRING
PASTURE
IS ALL
RIGHT**

BUT-

Don't Stop Feeding

your cows grain when you turn them on to pasture. The United States Government Bulletin No. 743 says:

"The bulky nature of pasture grass places a positive limit upon the capacity of the cow to take feed. In other words, the cow's stomach cannot hold grass enough to supply the required nutrients for maximum milk production, therefore a part of her ration should be of a more concentrated nature."

Because of this fact it will pay you well to feed

SCHUMACHER FEED AND BIG "Q" DAIRY RATION

GENEROUSLY, even when the cows are on abundant pasture. These two ideal feeds being composed of linseed meal and a variety of selected by-products of grains, corn, oats, wheat and barley, furnish the proper concentrated nutrients for bodily maintenance and health conditions—both of which are necessary for maximum milk production. Schumacher furnishes the proper carbohydrates and Big "Q" the right proteins.

Schumacher and Big "Q," being ready to feed, insures ACCURACY of the ration and SAVES the labor and uncertainty of home mixing. With Schumacher and Big "Q" you have a combination with which you can meet the individual requirements of every cow in your herd. That's why more Schumacher is fed to dairy cows than all other feeds in the world combined—that's why 36 World Champion Cows have been helped to make their world's records with these feeds—that's why you will find it the most profitable feed for YOUR cows. Your dealer can supply you. If not, write

The Quaker Oats Company

Address Chicago, U. S. A.

(D-4)



NOTES ON THE HESSIAN FLY

(Continued from page 521)

able us to judge when the frost has actually come, as to its probable effect on our crops.

There are several natural enemies which play a most conspicuous part in the natural control on the Hessian fly. Not infrequently one species of these parasites will overcome the pest in a neighborhood so effectively as almost to exterminate it. Probably the most im-

portant parasite of the Hessian fly in this country is *Polygnotus hiemalis*.

There is little to support the theory of "fly proof" varieties of wheat, but it is reported that some varieties of wheat can better stand the preying of the Hessian fly than others. It has been reported, however, that red varieties of wheat are immune from this pest because the leaves have a tendency to slant downward, so that the maggots fall to the ground as they migrate downward.

Methods for controlling the Hessian fly, the worst pest of the wheat field may be summarized: Sow the best of seed in thoroughly prepared, fertile soil after the major portion of the fall brood has made its appearance and passed out of existence, and, if possible sow on ground not devoted to wheat the preceeding year.

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Rapid Shoe Repair Shop
guarantees finest workman-
ship and perfect satisfaction

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314 STATE STREET

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HOME ADVERTISING.

By L. A. Dougherty, '21.

Have you ever traveled along a country road and observed the farmsteads and wondered who lived in this or that place? Sometimes you could make out a scrawl on the mail box and often you could not even get a clue then to whom the owner might be. Evidently he isn't proud of the fact that he owns the place or else he hasn't waked up to the fact that it might be well to let the public know who he is.

Ordinarily the general farmer raises only such produce as finds a ready sale in the ordinary channels of trade. There is little need of advertising his product. He raises an average product and receives the prevailing market price. But why be just an average farmer? There are so many already.

If you can produce some product which is above the average in quality or is not common, it deserves a special price and a special market. There are always people looking for such products. For such products as fruit, honey, poultry or butter, a home trade can often be established which will satisfactorily take care of the output. In many farming communities there is a very considerable demand for fruit.

Home advertising is given too little attention by many farmers. See if you are one of them.



Wheels on a track — the
Cletrac way — take less power

The Tractor for Summer Work

You men who go onto the farm this summer for practical experience will find the sturdy Cletrac shouldering the load of summer work.

The hot, horse-killing jobs in hay and harvest fields are speedily finished—the Cletrac working steadily on at the right pace for the job, slower in heavy hay or grain, faster if the crop is light.

It handles the belt work too—lines up quickly and uses the cheapest fuel economically.

Look for the Cletrac on the farms around you this summer. Cletrac owners will vouch for its all-year-'round dependability and great work capacity.

You are probably making a close study of all tractor types now. We will gladly furnish you with interesting and practical material that will give you a line on the all-purpose, tank-type Cletrac.

The Cleveland Tractor Co.

Largest Producers of Tank-Type Tractors in the World
19123 Euclid Ave.

Cleveland, Ohio

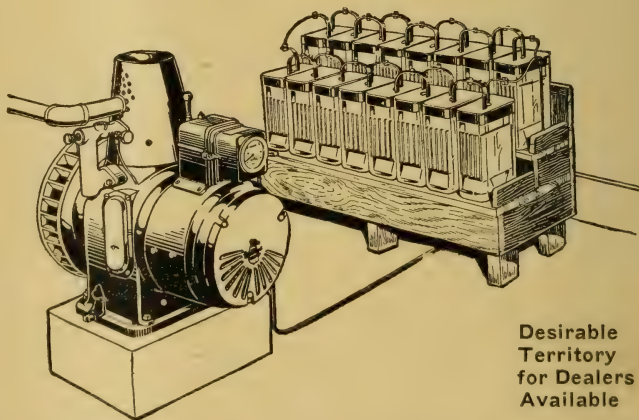


A Complete Electric Light and Power Plant for Farms

Its light brightens homes;
its ready power lightens
labor and saves time.

The Willys-Knight sleeve-valve engine improves with use. It burns kerosene, gas or distillate; self-starting, self-running, and self-stopping. Built by the world's largest manufacturers of motor car starting and lighting systems.

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Quiet
Knight*



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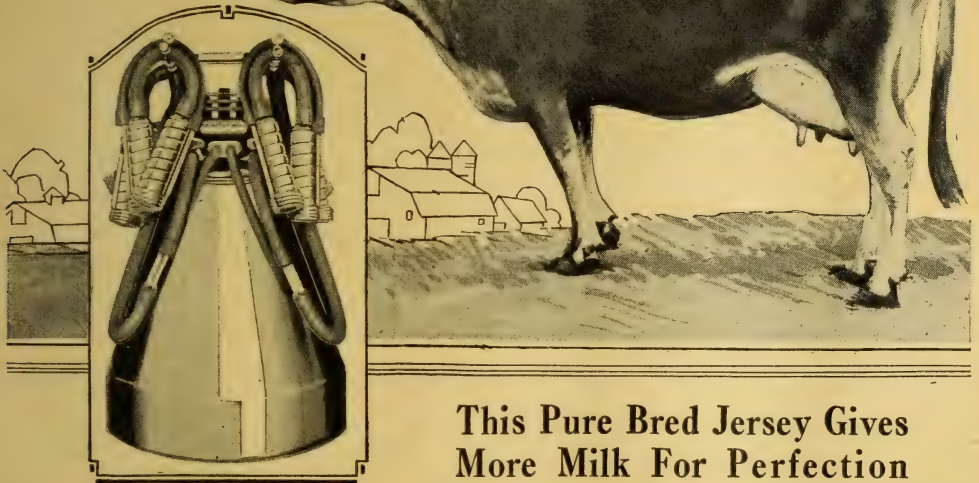
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EVANSVILLE, INDIANA.

The Willys-Knight Sleeve-Valve Engine

*Helena of Summit No. 304128,
owned by Albert Whitehead of
Pataskala, Ohio. Milked with
the Perfection.*



This Pure Bred Jersey Gives More Milk For Perfection

IF Helena of Summit, whose picture is shown above, could talk, she would tell you that she likes being milked with the Perfection as well as being milked by her own calf. Her milk records show that she prefers the Perfection to any other method of milking. As a three year old on Register of Merit test she gave 202 pounds of fat in the first four months. Her owner, Albert Whitehead, the well-known Jersey breeder of Pataskala, Ohio, says, "My cows are all in the Register of Merit and are now doing better milked with the Perfection than when milked by hand."

The Downward Squeeze and Adjustment the Reason

"The longer I use the Perfection Milker the better I like it," says Mr. Whitehead. "It not only enables me to milk the cows in half the time required by hand, but the cows seem to enjoy the action and stand better than when hand milked. The downward squeeze and the adjustments put the Perfection in a class by itself."

Mr. Whitehead is only one of thousands of dairymen who appreciate the nature-like downward squeeze which is exclusive with the Perfection and the simple adjustment which makes it possible to change instantly the suction and squeeze to suit either hard or easy milkers. These two features make the Perfection please the cow and get most milk for the dairyman.

Ask Us For Names, Addresses and Catalog

Why not investigate the Perfection Milker for yourself and ask Perfection owners what they think of it. We will gladly send you names and addresses of owners, together with a free copy of "What the Dairyman Wants to Know", the book that answers every question about milking machines. Write. Today.

Perfection Manufacturing Company

2146 E. Hennepin Avenue

Minneapolis, Minn.

The Perfection is the Milker with the Downward Squeeze Like the Calf.

PERFECTION MILKER

Fordson

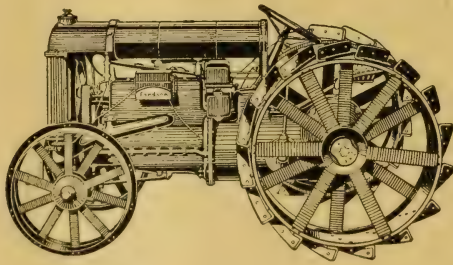
TRADE MARK

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Here's the one Farm Tractor that has real practical service behind it, and a tractor without prompt, efficient service cannot deliver its full value to the owner.

The Fordson Tractor will furnish all the power the farmer wants in farming and also all the power he may want for cutting ensilage and wood, for milking, electric lighting, household conveniences, etc. It is the marvel money-maker for the Farmer. Talk it over with the Fordson dealer and your banker.

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An enormous sum
—and yet,
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We sold over Forty-One Million Dollars worth of Live Stock for our patrons at Chicago and Kansas City and remitted them that amount last year. Our sales this year will exceed last year.

We are one of the **SEVEN** largest Live Stock Commission Houses on the Chicago Market and we are also one of the **SEVEN** largest Houses on the Kansas City market.

We sell the experimental and fat cattle for the Animal Husbandry Department of Purdue University, Illinois State University and the Missouri State University and also the Experimental cattle from Worcester, Ohio.

LET US HANDLE YOUR NEXT SHIPMENT

Alexander Conover & Martin

LIVE STOCK COMMISSION

U. S. YARDS, CHICAGO

BRANCHES: KANSAS CITY, MO., ST. LOUIS, MO.

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(HOG FOOD)

Manufactured in accordance with the Indiana Feeding Stuffs Control Law—Guaranteed to contain not less than 60% Protein, 6% Fat. Is recognized as one of the leading brands on the market and a very profitable article when fed at any season throughout the year. A trial will convince you of its merits.

Insist on obtaining “KINGAN'S” Digester Tankage of your dealer.

KINGAN & CO. LTD.

BEEF AND PORK PACKERS,
INDIANAPOLIS, IND.

Smoke Your Own Meats

IN THE EUREKA Portable Smoke House

With this wonderful smoke house, home curing, smoking and storing of hams, bacon, sausage and fish become practical and easy.

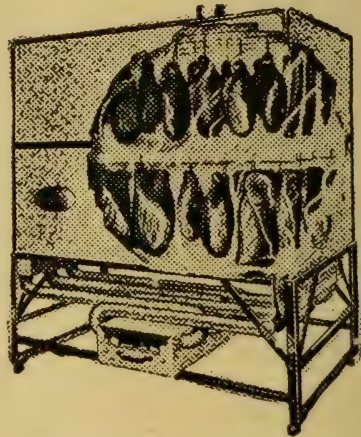
It is compact and can be taken through an ordinary door. Made in all sizes, ranging from two-hog capacity on up.

Can be operated from chimney same as stove and requires very little attention. Smoke goes through an air-cooled radiator before reaching meat, and can not overheat.

Glass doors, to watch operation, absolutely fireproof, complies with all fire insurance laws, saves money and does the work very satisfactorily.

Write today for circular explaining the greatest common sense smoke house built right here in Indiana.

Guaranteed by manufacturer for at least 20 years. We have some desirable territory open for live dealers and agents in Indiana.



Sectional View of the Eureka

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INDIANAPOLIS



The Feed That Makes the Milk Yield



IF you have not made up your mind as to what is the best feed for large milk production, for either summer conditions or heavy feeding in winter, visit the dairy farmers in the eastern states and see what they feed. These farmers are supplying large markets with milk. Their principal production is dairy products.

Ask them what high-protein feed they are using to make up the main strength of their rations. The answer will invariably be that they are feeding Buffalo Corn Gluten Feed, and, have fed it for a good many years—and in a great many cases, their fathers fed it before them.

Corn Products Refining Co.
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ACID PHOSPHATE**

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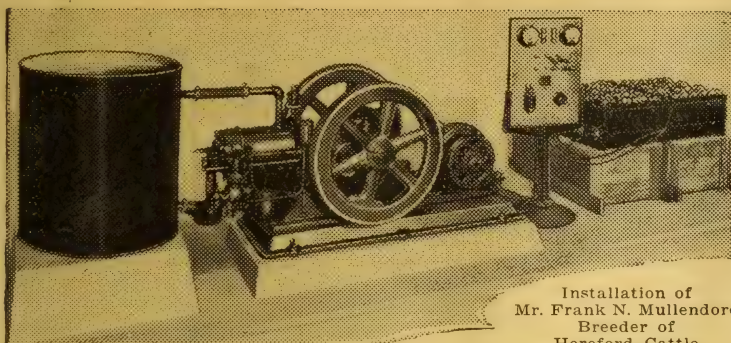
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And why? First, because the Swartz is a good plant, a plant designed properly and made honestly. Because the Swartz does the work faithfully day in and day out, year after year. Second, because your interests are safeguarded and protected by Swartz Free Factory Service, assisting you in the most efficient operation of your system,—plus immediate help should trouble occur. And third, because Swartz Products are guaranteed for Five Years. A guarantee like this proves high quality throughout.

A feature that you cannot afford to overlook is that unless you are satisfied with the Swartz you buy, your money is refunded.

A Word as to the Swartz Policy

From the standpoint of permanent success, the most important feature in any product is that it gives the user 100% Service and 100% Value. As a light plant user you are entitled to this. The satisfaction secured by your neighbors who own Swartz Systems, is the best proof, of why you, too, can buy a Swartz and run no risk.

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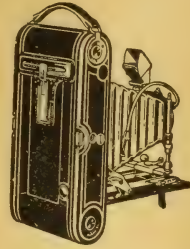
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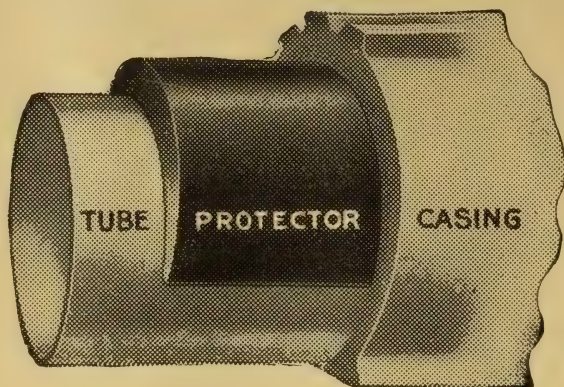
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Are Your Cows 100% Producers?

CATTLE, like humans, must have a well balanced ration if they are to produce all the results of which they should be capable. Good treatment and the right proportion of protein, carbohydrates and fat will cause dairy cows to give a full amount of rich milk. This ration will be found in

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This dairy feed is the result of long experiment by experts who have made a life study of the proper feeding of animals. Every ounce of it is pure, wholesome food, as it contains no cheap fillers and no waste. Dairy cows like it because it contains the exact proportions of health-giving, milk producing elements that Nature demands. Any up-to-the-minute dairyman realizes the vast importance of proper feeding. Every cow in his herd must be an asset, not a liability. This condition can be obtained only by giving the animal a feed that will produce the result,

and examination of the tags on Acme Dairy Feed, where, as provided by law, the ingredients of which this feed is composed, are set forth, will convince you that this feed is superior to all others. We invite comparison with the feeds of other manufacturers. Our feed has been tried by thousands of the leading dairymen of the country who have given it their unqualified endorsement. It is not a new experiment, but has stood the test of many years. For milk that is pure and contains the highest percentage of butter fat, use Acme Dairy Feed.

A Feed for Every Animal

There is an Acme Feed for every animal. Try Acme Hog Feed for hogs; Acme Scratch Feed for laying hens; Acme Stock Feed, general purpose; Hominy Meal, general purpose; Acme Horse and Mule Feed; Alfalfa Molasses Grain Feed for horses; Acme Farm Feed, general purpose, and Acme Barleycorn Feed, pure grain mixture.

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Sharples

SUCTION-FEED CREAM SEPARATOR

the only separator that gets
all the butterfat all the time

ACTUAL tests made at state colleges (New York, New Hampshire, Purdue, Vermont and others) verified the Sharples statement that the Sharples Suction-feed *skims clean at any speed*. It couldn't have been otherwise, as the Sharples mechanical principle is simply an application of a known law of nature.

"Fixed-feed" separators (all separators except the Sharples are fixed-feed) *lose* butterfat when turned *under speed*. All separators are turned under speed 95% of the time.

Remember then, to get *all* the butterfat *all* the time, *you must use the Sharples Suction-feed*.

THE SHARPLES SEPARATOR CO.
West Chester, Pa.

Branches:
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Penny Wise—Pound Foolish Separator Buying



Many buyers of cream separators are tempted to save \$10 or \$15 in first cost by buying some "cheaper" machine than a De Laval.

In practically every case such buyers lose from 10 to 50 cents a day through the use of an inferior separator.

That means from \$36.50 to \$182.50 a year—and not only for the first year but for every year the separator continues in use.

Twice a Day—Every Day in the Year

It should always be remembered that the cream separator saves or wastes in quantity and quality of product, and in time and labor, twice-a-day every day in the year.

Moreover, a De Laval Separator lasts twice as long on the average as other separators. There are De Laval farm separators now 28 years in use.

The best may not be cheapest in everything but it surely is in cream separators.

THE DE LAVAL SEPARATOR COMPANY

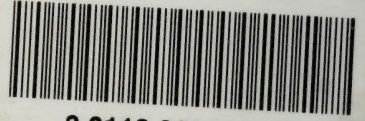
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